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COMPUTERWORLD

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FAA HOLDING PATTERN

Air system upgrade off course by $15B

First part of a two-part series.

BY J. A. SAVAGE
CW STAFF

It was big game day in Dallas last Oct. 14. The Dallas-Fort Worth Airport was expecting heavy traffic as fans came pouring in for the football contest between the University of Texas and the University of Oklahoma.

In fact, airport officials were so worried traffic might swamp the air traffic control computers that a software technician was on hand — just in case — with a patch to take noncritical applications off-line.

The officials' fears were warranted. The sky was full of commercial and private planes, and the CPUs were overloaded; when the software patch was applied, the controllers' screens froze for 19 minutes.

During that time, more than 100 airplanes were near the airport, and air traffic controllers reported that "a bunch" came closer to each other than is deemed safe. What prevented a disaster? Only good weather and high visibility, controllers said.

Despite the 1981 approval of a comprehensive multibillion-dollar plan to upgrade its computers to handle a steadily increasing number of flights, such as those at Dallas-Fort Worth, the systems needed to handle congested air traffic are not in place — a result, critics said, of the Federal Aviation Administration's lack of contract management skills and its resistance to hiring a primary contractor.

The FAA, abetted by slack congressional oversight, is far behind in its own schedule to modernize the nation's air traffic control system and $15 billion over the original budget. Of 12 "major systems acquisitions" included in the modernization plan, only one has been implemented — and that involved mainframe computers superseded by next-generation technology a year before the first CPU was deployed.

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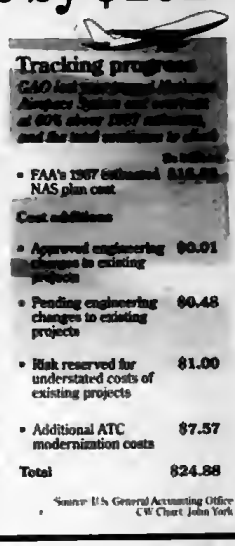
Fly by wire

Airbus crash highlights in-air systems. Page 107.



1-2-370: Lotus to finally land on host

Enterprise strategy will position mainframes as spreadsheet servers

BY PATRICIA KEEFE
CW STAFF

NEW YORK — 1-2-3/M, the version of Lotus Development Corp.'s popular desktop spreadsheet for IBM mainframes, will finally make its long-overdue debut at a joint press conference tomorrow — almost three years after its initial unveiling.

In an interview last week, Frank King, senior vice-president of Lotus' Software Products Group, said Lotus was not building a mainframe spreadsheet per se. "We are providing an enterprisewide spreadsheet model that will become the hub of the corporation," he said. "It's a way of reintegrating what information systems is good at with what personal computers are good at." Shipment is scheduled for the first half of this year.

Peter Murphy, a second vice-president of data processing at The Travelers Corp. in Hartford, Conn., would not go quite that far. "We'll take a serious look at it," he said, adding that Travelers will likely find only a few uses (mostly consolidation) for a very large spreadsheet.

Equitable Life Insurance in New York was less enthusiastic. Currently a desktop user of 1-2-3, it has no interest in a host version, a spokeswoman said.

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'Open your door or we'll sue,' says software piracy patrol

BY CHARLES VON SIMSON and CLINTON WILDER
CW STAFF

Many information systems executives may have never heard of the Software Publishers Association, but some are getting a not-so-pleasant introduction.

The Washington, D.C.-based association, which represents some 500 personal computer software publishers — from Microsoft Corp. to small applications vendors — is aggressively ramping up its software piracy enforcement efforts. The organization acknowledged last week that it is sending letters to chief executive officers of targeted corporations — bypassing IS managers — telling them that they are believed to have unauthorized copies of PC programs in violation of software copyright laws.

The SPA contends that as many as 50% of all PC software programs in the U.S. are unauthorized, and some IS managers agreed that the practice is widespread. "Sure, we have unauthorized software copied within the company," said one PC manager at a San Francisco-based Fortune 500

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Grim outlook grips DEC in profit vise

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — Bad news came in triplicate last week for Digital Equipment Corp.

A flurry of news reports focused on the possibility of DEC's first-ever fiscal quarterly loss, rumors of shipping delays for the VAX 9000 mainframe and talk of employee cutbacks.

Yet when a group of DEC's largest customers — all chief information officers at major companies — gathered in Boston for a high-level meeting with DEC President Kenneth H. Olsen and his senior vice-presidents last week, the atmosphere was positively upbeat.

Nary a word was heard about shipping delays or bugs in the long-awaited VAX mainframe, said one CIO who attended the meeting.

"We're expecting a VAX 9000 to be delivered this fall," said William Anderson, CIO of Prudential-Bache Securities in New York. "I would think they

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"The annual memo doesn't quite do it, but tie-snipping definitely had an impact."

RON GOLDFARB
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On his policy of cutting the machine of employees using pirated software. See story page 1.

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UPDATE

Apple Computer Chairman John Sculley is defending payments of up to $50,000 to executives who are losing their company cars, saying the payment "does not match the actual cost of a relatively new executive automobile." Makes you wonder what kind of Euro-luxury boat is considered an executive automobile by Apple's elite. It also raises the issue of just how much farther the famous Apple spirit can reach in a company demoralized by such tales of high-level excess. Maybe what's needed is a little fighting spirit — more along the lines of a tiger than a Jaguar.

O'Connell

Networks form the backbone of IS for a medical complex. Page 41.

Joyce Rand

Elven Riley at Manufacturers Hanover marries technology to cross-functional business strategy. Page 53.

EXECUTIVE BRIEFING

■ **The FAA's computer modernization plan** is $15 billion over budget and four years behind schedule, raising concerns over air-traffic safety. A House panel begins hearings this week on the plan's progress and additional FAA funding requests. The increased computerization of airplane cockpits has been controversial. Some air disasters, including an Indian Airlines crash earlier this month, may have been caused by problems with automated guidance systems. **See stories pages 1, 106 and 107.**

■ **Doing more for less** is the watchword for many IS executives, who are finding that outsourcing isn't the only way to stretch dollars. Some IS organizations find a significant cost advantage in using commercial software instead of home-built systems, but there are trade-offs involved. When deciding whether to buy or lease hardware, more companies are demanding that leasing firms show them proof of financial advantage. Decentralization has often been implemented as part of a drive to save money, but there can be added costs that don't become apparent until after the fact. **Page 63.**

■ **The ESA operating system** is no IBM silver bullet against plug-compatible competitors. Amdahl Corp. and Hitachi Data Systems customers report that there have been few problems in installing and running ESA on their machines. **Page 4.**

■ **Without high-level sponsorship,** executive information systems projects are probably doomed to failure. The growth of EIS as a competitive business weapon will be hindered by the difficulty of measuring the improvement of business decisions enabled by the systems. **Page 14.**

■ **A major personal computer software trade organization** has adopted hardball tactics against corporate users of unauthorized copies of software programs. The Software Publishers Association has mailed letters to some 30 suspect corporations, demanding to audit their personal computer software usage or risk a lawsuit. More letters will be on the way. **Page 1.**

■ **DEC customers aren't worried** about possible shipment delays of the mainframe-class VAX 9000. However, DEC stockholders are very apprehensive about the possibility of the organization's first-ever loss in this quarter — and DEC employees appear to have plenty of reason to fear further workforce cutbacks. **Page 1.**

■ **The mainframe version** of Lotus 1-2-3 debuts this week, almost three years after its initial announcement. Lotus is pitching the software as a corporatewide spreadsheet standard. Early users include Sears, Roebuck and Co. **Page 1.** Also this week, HP unveils the next generation of its laser printers. Laserjet III promises more speed, more fonts, higher resolution and Macintosh compatibility. **Page 7.**

■ **On-site this week:** Merrill Lynch is bullish on SQL connections to DB2. Some 250 Merrill investment bankers, currently using Irma board links to disparate mainframe databases, are moving to SQL with Microsoft Windows as the interface. **Page 37.** The country club and health-spa life is serious business at Dallas-based Financial Management Corp., which handles information for some 185 leisure clubs affiliated with Club Corporation International. FMC uses Computer Associates' Datacom/DB, running on an IBM 4381 host, to house data culled from 165 IBM System/36 minicomputers. **Page 31.** The Harvard Medical School operates on a $2 million fiber-optic network, linking 22 campus buildings to HP and DEC minis. Jim Fitchett, the venerable school's first IS director, is also implementing ISDN. **Page 41.**

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DEC

FROM PAGE 1

would have mentioned it if there was a problem."

Another large commercial customer also expressed optimism that his DEC mainframe would be delivered this summer.

"We really think the program is pretty much on target for our application and environment," said Michael Guider, vice-president of network services at Litel Telecommunications Corp. in Columbus, Ohio. "We're well aware that any brand-new system will have its time to settle in before it's put into production service."

Litel, which will expand its Vaxcluster system and use the VAX 9000 for billing and order processing, will have one of first fully loaded applications for the mainframe, Guider noted. The firm provides long-distance phone services to customers in several midwestern states.

Wall Street analysts have been predicting a $1.8 billion boost to DEC's bottom line once the mainframes begin shipping in volume, but rumors of delay have undermined their confidence. "A lot of analysts are concerned DEC may actually report a loss," said Robert Herwick, an analyst at Hambrecht & Quist, Inc. in New York. "The company frankly doesn't deny the possibility."

Company spokesmen and computer industry analysts, however, downplayed rumors about delays of the VAX 9000, saying the bugs were typical of a complex new system. DEC's sales goal is to ship 150 of the mainframes this year and another 1,300 in 1991.

"Routine debugging is going on, but I don't believe it's anything more than that," said Peter Schay, an analyst at Gartner Group, Inc. in Stamford, Conn. "A slip of even four or five weeks would be normal."

Several customers have been visiting the Marlboro, Mass., facility to run their software on the big VAX, but the lack of beta-test sites is raising concerns among the analysts.

A high-end system "has a lot of things you want to check out in the field," Herwick said. DEC spokesman Mark Steinkrauss played down the importance of beta testing, however. "This whole notion of putting the machine outside the company for testing is becoming passe with the use of simulation," he said.

Terry Shannon, an analyst at International Data Corp. in Framingham, Mass., said he believes the machine is on schedule despite reported problems with the mainframe's vector processing facility. A vector processor is an add-on device that boosts computational speed for scientific and technical applications.

Peter Ross, product manager for the VAX 9000, said he sees "no major shift" in DEC's ability to ship vector processors with the entry-level Model 210s this summer. "There might be some delay," he said, "but it depends on manufacturing volume."

DEC also confirmed last week that internal cost-cutting measures are ramping up. Schay said the "primary candidates" for cuts are the manufacturing operation and headquarters staff positions.

The company is already shifting corporate positions to revenue-generating field service, hoping to slim down overhead expenses for its 125,900 employees worldwide, Steinkrauss said.

Other alternatives include budget cutbacks for the second time this fiscal year, consolidating facilities, offering voluntary severance packages to thousands of employees and even trimming back on research and development.

"Everything is under scrutiny," Steinkrauss said. "Nothing is untouchable."

DEC makeover

Digital Equipment Corp. is expected to reveal a major update of the VMS operating system and a new version of its RDB relational database management system during the Feb. 27 announcement of its fault-tolerant VAX, industry analysts and large DEC user sites said last week.

VMS 5.4 is said to include features that support distributed computing and transaction processing. Terry Shannon, director of International Data Corp.'s DEC Advisory service, said DEC will introduce a new version of the Decintact teleprocessing monitor.

"Integrating teleprocessing into the [VMS] operating system itself is better than layering it on top of the OS," said Phil Auberg, DEC's manager of VMS marketing, during a recent meeting at DEC's Western Software Laboratory in Mountain View, Calif.

JEAN S. BOZMAN

Mainframe challengers cross ESA finish line

BY ROSEMARY HAMILTON
CW STAFF

At least two customers of IBM plug-compatible mainframe (PCM) vendors recently installed IBM's premier operating system, MVS/ESA, and are reporting no major problems.

If nothing else, these users prove that the so-called IBM silver bullet theory is wrong — again.

In the mainframe world, there has long been talk that IBM would one day fire a silver bullet at its competition in the form of a new operating system so complex and so tied into its own hardware that the PCMs would not be able to support it.

Recently, however, both Amdahl Corp. and Hitachi Data Systems, the two major PCMs, claimed to have several customers who run ESA.

A Hitachi spokesman said that the ESA compatibility project took about 12 months, and the company considered it about half as difficult as the MVS/XA compatibility project. It took Hitachi approximately 18 months to achieve XA compatibility, the spokesman said.

An Amdahl spokeswoman said the company does not discuss such projects.

However, both kept their commitments to offer this support by the end of 1989 and have been moving customers to ESA over the last few months.

Stalking the giant

Amdahl and Hitachi Data Systems are working to stay competitive with IBM by proving their abilities to run IBM's MVS/ESA operating system

	Jan. '87	Jan. '88	Jan. '89	July '89
Amdahl 5890, 5990	2%	7%	9%	10%
IBM 3090 series	97%	90%	88%	87%
Hitachi AS/XL, EX	1%	3%	3%	3%
Total estimated population	1,419	2,709	3,981	4,330

Source: Computer Intelligence

CW Chart: Marie Hanes

Hydro Quebec in Montreal, which has been running ESA in test mode on a Hitachi mainframe, recently had a delay in its ESA conversion schedule because of problems with ESA on IBM hardware, according to Claude Sylvestre, director of information services. ESA testing on the Hitachi mainframe has gone smoothly, added Jean Marie Dupre, chief of service.

Hydro Quebec, the major provider of electricity to the province of Quebec in Canada, began an ESA conversion for both its IBM 3090 Model 600S and Hitachi EX/100 last year.

It is standard procedure at Hydro to wait until the IBM operating system is available for both IBM and PCM hardware and then move both at the same time, Sylvestre said.

"All the tests are done, and on problems have been detected," Dupre said in an interview last month. "We have the green light to go [into] production with the IBM system in the first weekend in February and in the second weekend, we'll go with the Hitachi machine."

However, that schedule was interrupted earlier this month when a glitch occurred during the production-mode switch on the 3090. According to Michel Lecuyer, a technical adviser, the problem seemed to be associated with the catalog address space under ESA. Until it is resolved, Hydro will delay moving the Hitachi to production mode, but Lecuyer said it should be fixed by month's end.

Easy ESA

US West Communications, an Amdahl user site, reported no problems with its ESA conversion. Its Omaha data center has been in ESA production mode since December 1989.

The data center, which runs an IBM-Amdahl mix of mainframes, also tried to convert both hardware platforms at the same time. According to Mike Huggenberger, manager of system control programs, "you couldn't really tell the difference" between the IBM and Amdahl upgrade to ESA.

Huggenberger said be would have liked to have moved to ESA earlier in 1989 but instead waited for Amdahl.

"It took them roughly 16 months to provide us with compatible hardware," be said. "That was a bit of a disappointment, but I don't believe it hurt us from a dats processing standpoint."

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Study on VDT link to reproduction delayed

BY ELLIS BOOKER
CW STAFF

The release of results from a major epidemiological study on video display terminals (VDT) and reproductive problems in women has been delayed until September, *Computerworld* has learned.

This is the second delay for the National Institute of Occupational Safety and Health (NIOSH) report, which had been expected next month. The NIOSH study, which began in 1986 following a number of anecdotal reports of miscarriages among women who worked with VDTs, was originally scheduled for publication late last year.

"The delays are legitimate scientific delays," said Roger Tatken, chief of the information retrieval section at NIOSH in Cincinnati. Tatken said NIOSH has taken longer than expected to analyze the data from the study.

In addition, he said, the growing ubiquity of the VDT in the workplace made it difficult to find equivalent populations of women who used VDTs and those who did not.

The study ultimately tracked 2,000 female telephone operators for local phone companies as VDT users and an equal number of female telephone long-distance operators "who were not using VDTs at that time," Tatken said.

Even if the NIOSH study reveals a statistically significant correlation between reproductive problems and VDT use, this will not establish a causal factor. However, Tatken noted that there are already three leading hypotheses that could account for such a correlation: psychological stress caused by repetitive and boring work with VDTs; physical stress, caused by poor ergonomic design of VDT workstations; and, finally, low-level, non-ionizing radiation emitted by VDTs.

Under the law, NIOSH studies are typically delivered to the Occupational Safety and Health Agency along with formal recommendations for health and safety guidelines.

The NIOSH study focuses exclusively on the alleged reproductive effects of VDTs rather than repetitive motion injuries, which have also been attributed to some kinds of work with VDTs.

"I don't think you'd get much quarrel with the evidence that poorly designed workstations can cause harm," Tatken said.

Wang PC mail plan finds doubt

BY RICHARD PASTORE
CW STAFF

Wang could try mailing out envelopes sporting Ed McMahon's picture. In lieu of that, however, users and analysts expressed doubt that Wang Laboratories, Inc.'s latest stab at the personal computer mail-order market can succeed.

Last week, Wang began selling a line of Taiwanese-built PCs under the brand name WLT PC Express. The 10 initial boxes range from a 12-MHz Intel Corp. 80286-based unit to an Intel 80386SX machine incorporating IBM's Micro Channel Architecture. Base prices range from $1,175 to $2,225.

Wang estimates that the mail-order business accounts for 15% of total U.S. PC sales. "That's a sizable chunk of the market, and we see this as an opportunity to gain some incremental PC business," said Robert Lerner, general manager of WLT Systems, Inc., the newly formed Wang direct-response company that will distribute the systems in the U.S.

However, users who purchase PCs through the mail told *Computerworld* that they would hesitate to buy from Wang. "Because of the [financial] problems they've been having, I don't know if I'd deal with them," said Stuart Denrich, vice-president of data processing at Valu Food, Inc. in Baltimore. "My concern is, what's the longevity of the company?"

Analysts echoed users' trepidations. "Given the financial woes that Wang has experienced, why would you buy from them?" said Lee Levitt, an analyst at International Data Corp. in Framingham, Mass. "It's going to be an uphill battle for them."

Other users said they prefer to remain loyal to mail-order leaders that have won their confidence.

"We're fairly satisfied with Dell [Computer Corp.], so we probably wouldn't do business with Wang," said George Thompson, IS supervisor at Westvaco in Newark, N.J.

Some analysts wonder if Wang is healthy enough to power this venture. The company's support resources are lean, said Chris Christiansen, an analyst at The Meta Group, Inc. in Westport, Conn. Yet Wang is responsible for providing a year of free on-site support for the WLT PCs.

"It's questionable how much support these folks will get; what the response time will be," Christiansen said. "Who comes first, a PC customer or a VS10000 customer?"

Analysts pointed out that Wang's microsystems division tried to enter the mail-order market two years ago, but the effort failed and was scuttled. "The quality of the [telephone support] people was marginal, and the pricing was not competitive," Christiansen noted.

"It sounds like they've put that group back together in another form," Levitt said. "I think they're grasping at straws."

Great expectations

Despite the allure of low prices, direct-mail PCs accounted for a small fraction of PC sales in 1989, according to market research

Number of 1989 U.S. units purchased: 9.1M

Source: International Data Corp.
CW Chart: Marie Haines

Unix elevated to IBM mainstream status

BY AMY CORTESE
CW STAFF

Just one week after its forceful re-entry into the workstation market, IBM underscored its commitment to Unix and implied that it will let its multiple midrange systems fight it out in the arena of customer preference.

Attendees at IBM's annual conference for business partners said IBM does not appear to be fighting the tide of business applications that may be on the way for the speedy RISC System/6000, although it continues to position the workstation line as a science and engineering tool.

Likened by some to a politburo meeting, the conference is an opportunity for attendees to get a sense of the IBM party line. This year's conference, which drew over 1,000 consultants and business partners to Palm Springs, Fla., marked the sanctioning of Unix, according to attendees.

"Unix has joined the IBM mainstream," declared Dan Culhane, a consultant at Stamford, Conn.-based Gartner Group, Inc.

Attendees said that Unix and interoperability with IBM's Systems Application Architecture (SAA) were central themes. "There was continual reference to SAA and Unix in same breath," Culhane said, adding that proprietary conventions are now talked about in conjunction with standards from the Unix world.

The powerful RS/6000 line and IBM's strong commitment to it will attract third parties that previously did not consider Unix, analysts said. "For people that have been living in IBM's embrace, this has been an eye-opener," said Michael Millikin, vice-president of Patricia Seybold's Office Computing Group. "If you are an IBM business partner, Unix is now in your lexicon."

"IBM's focus on Unix will cause us to pay more attention to it," added Jim Emerson, vice-president of technology at Pansophic Systems, Inc., a longtime provider of software for IBM's proprietary platforms.

However, much of SAA's airtime was spent bolstering the Application System/400, IBM's proprietary midrange platform that observers say is most likely to be hurt by the RS/6000 family. IBM portrayed its AS/400 business as healthy, growing and complementary — not competitive — with its new RISC family, attendees said. But according to Millikin, "a number of business partners were looking at the [attractive] RS/6000 pricing and saying 'this is a no-brainer' " because the RS/6000 offers much better price/performance.

IBM has adopted an almost Darwinian philosophy of letting the market decide among its many midrange offerings, whether proprietary or Unix-based. This year, the message from IBM is "whatever you want, we will give you," Millikin said.

However, IBM clearly has its own preferences. "Whatever the customer wants, they will sell, but that doesn't mean they will lead with the RS/6000," maintained Nili Young, vice-president of midrange strategies at Meta Group, Inc. "The initial thrust will be SAA whenever possible."

"IBM was not directing the audience to one or another system," said Sam Albert, president of Sam Albert & Associates.

Standards group formed for DOS extender products

BY PATRICIA KEEFE
CW STAFF

SANTA CLARA, Calif. — An agreement to form a standards committee for extending DOS memory under multitasking environments was forged last week by vendors that plan to issue a working specification within 90 days. The finalized standard is scheduled to ship later this year.

Ben Williams, vice-president of Rational Systems, Inc., said Microsoft Corp. agreed to some major technical changes in its own controversial DOS extender proposal that will "make it reasonable for extended applications to work in a Windows environment."

Applications incorporating the new technology, DOS Protected Mode Interface (DPMI), could be out as early as year's end, said Williams and Mark Chestnut, Microsoft's product manager for DOS.

"Windows 3.0 will not be DPMI, unless they hold up shipment until year's end," Williams said. Microsoft is expected to announce Windows 3.0, which is supposed to have a DPMI-compatible mode, in mid-April.

Attendees included IBM, co-hosts Microsoft and Intel Corp., applications developers such as Lotus Development Corp. and Borland International and DOS extender vendors such as Phar Lap Software and Rational.

DPMI is an incompatible upgrade from the current de facto DOS extender standard, Virtual Control Program Interface (VCPI), which lacks Intel or Microsoft support. VCPI's acknowledged shortcomings include a failure to take advantage of multitasking or virtual memory. Williams said that if OS/2, Windows and Unix support DPMI, developers using DPMI will only have to write one version of their applications to run under all three.

CORRECTIONS

The price of Microrim, Inc.'s R:Base Version 3.0 unlimited user package is $2,695, not $995, as was reported on page 14 of the Jan. 29 issue of *Computerworld*.

John J. Davis, the author of last week's Computer Careers column, was described improperly at the end of the column. His New York-based company, John J. Davis & Associates, Inc., is an executive search firm.

EDS to run Texas Air systems in deal to buy into System One

BY CLINTON WILDER
CW STAFF

Thanks to information systems, the nation's largest car company has entered the airline business.

Electronic Data Systems Corp. (EDS), the IS unit of General Motors Corp., last week consummated its long-rumored intention to run an airline computer reservation system (CRS) by buying a 50% stake in Texas Air Corp.'s System One for $250 million. EDS also signed its largest-ever commercial contract, a $4 billion pact to take over the IS function of Texas Air's two major operating units, Eastern Airlines and Continental Airlines, for 10 years.

The emergence of EDS as the first non-airline to join the competitive but lucrative CRS business may be applauded on Capitol Hill. A pending Republican-sponsored Senate bill would force airlines to divest their CRSs [CW, Oct. 23, 1989]. With Texas Air retaining its half-ownership of System One, however, the deal may fail to temper the legislative climate.

System One is the third-largest CRS in the U.S., with about 20% of the market.

United Airlines' Covia Corp., creator of the second largest CRS, reacted coolly to the sale. "We understand the financial benefit of this partnership for System One, but we question the benefit for the travel agency community," Covia Vice-President of Marketing Lynne Rosenbaum said in a statement. She could not be reached for further comment.

Dallas-based EDS will directly hire 2,200 Texas Air IS employees and acquire four data centers: two supporting Eastern in Miami, one supporting Continental and System One in Houston and one supporting Continental in Los Angeles. Consolidation of those centers with other EDS facilities "is not beyond the realm of possibility, but it's premature to speculate at this point," said EDS spokesman Roger Still. "We'll do what we need to do to serve the customer and keep our margins up."

Texas Air's well-publicized financial woes, including Eastern's Chapter 11 filing, prompted the moves. In addition to the money received for half of System One, Texas Air's $400 million annual payment to EDS for processing services represents a 10% saving over Texas Air's current IS budget, company spokeswoman Charlotte Kirk said.

The 1,100 System One IS employees in Houston will continue to be employed there by the renamed EDS/System One CRS Partnership.

As part of the $250 million price, EDS also acquired sole ownership of System One's Airline Services Division, which provides scheduling, ticketing and other services to smaller regional airlines.

That division, plus improvements in System One's technology over the past three years, accounted for the big gap between EDS's price and the $100 million note that Texas Air paid Eastern for System One in 1987, Still said. Texas Air Chairman Frank Lorenzo was criticized by Eastern's striking pilots' union for getting a fire-sale price for System One at that time.

HP will upscale laser printer line

BY J. A. SAVAGE
CW STAFF

Hewlett-Packard Co. today is scheduled to announce a new series of Laserjet printers to replace its popular Laserjet II.

Laserjet III will be less expensive and have higher resolution, more fonts and faster graphics printing than its 3-year-old predecessor, according to the organization.

While the HP will no longer sell Laserjet II, Laseret IIP and IID will remain on the market.

Laserjet II users will be able to change over to a Laserjet III without changing applications. However, not all software vendors have made the necessary modifications in their packages to support Laserjet III capabilities, according to a spokeswoman.

The Laserjet III allows for higher resolution by adjusting the size of dots. The new printer can also change the position of the dots by adjusting the length of time the laser hits the drum.

Instead of requiring a separate software package to adjust the size of print within a document through bit-mapping, Laserjet III will do it within a single software application. The new printer font sizes reside in the machine itself.

Also new to Laserjet III is Apple Computer, Inc. Macintosh compatibility. According to HP, a Macintosh version of Laserjet III is scheduled to be out this summer.

Laserjet III is slated for availability March 1 for $2,395, about $300 less than Laserjet II. Prices on Laserjet IID, with dual feeding trays, will be reduced by $800 to $3,495.

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NEWS SHORTS

Anti-monitoring bills gain support

U.S. Sen. Paul Simon (D-Ill.) last week introduced a bill that would bar employers from conducting secret electronic monitoring of their employees. That bill and similar legislation filed earlier by U.S. Rep. William Clay (D-Mo.) won the backing of the Communications Workers of America, which condemned monitoring of employees' telephones and computers as a disciplinary whip rather than a performance improvement tool.

Memory pact finalized

It's official. EMC Corp. and Storage Technology Corp. signed a deal announced earlier this year that allows Storage Tek the exclusive marketing rights to EMC's memory products for the IBM 3090 mainframe family. Storage Tek said it picked up $4 million worth of EMC memory at the signing. The deal is supposed to be worth more than $100 million over three years. EMC and rival Cambex Corp. started a third-party 3090 memory market a little more than a year ago. EMC will continue to sell memory products for IBM's smaller mainframes.

Proprinter prices cut

IBM cut prices of its Proprinter line from 5% to 28% last week. The low-end Proprinter II impact printer will now sell for $49 less than its previous price of $575. The price for the high-end Model X24E dropped $40 to $859.

Teradata to acquire Sharebase

Database systems company Teradata Corp. announced plans for the friendly takeover of Sharebase Corp., a vendor of mid-range database software and servers. Sharebase, formerly known as Britton Lee, Inc., was an early entry into the database market with proprietary client/server architecture. According to Teradata, Sharebase's employees would remain, as well as its offices in Los Gatos and Berkeley, Calif.

Bull, Zenith butt heads

A once friendly deal has turned bitter between Groupe Bull and Zenith Electronics Corp., which are engaging in a $100 million dispute over the purchase price that Bull paid for Zenith Data Systems. In the dispute, which could go to an arbiter if it is not resolved within 60 days, Bull claims that Zenith Data Systems is not worth the $496.4 million it paid for the division late last year. Meanwhile, Zenith Electronics charges that Bull owes an extra $50 million, for a total of almost $550 million.

Symphony does encore

Symphony, Lotus Development Corp.'s integrated desktop package, got a shot in the arm last week as the spreadsheet maker rolled out a series of new features. Most notable was support for Personics Corp.'s @Base add-in to provide a Lotus-style interface to Ashton-Tate Corp. Dbase III.

DEC hops buses

Digital Equipment Corp. last week announced its intention to provide the industry-standard VME bus and "Futurebus-plus" on its workstations and minicomputers. Futurebus-plus is now under development by the Institute of Electrical and Electronics Engineers, Inc., but is at least five years away from the market. Infocorp analyst Mike Casey noted that support for the VME bus will allow DEC "to go directly head-to-head with some of the open platform people like Sun."

ALR announces EISA systems

Advanced Logic Research, Inc. last week unveiled three high-end personal computers incorporating the IBM Extended Industry Standard Architecture bus. The boxes are based on a 33-MHz Intel 80386 chip, a 25-MHz 80486 chip and a 33-MHz 486 chip. Each comes standard with 5M bytes of memory and one 1.2M-byte, 5¼-in. floppy disk drive. Prices range from $5,795 to $12,495.

More News Shorts on page 108

Dodge, M&D watchers vague on future

BY NELL MARGOLIS
CW STAFF

WELLESLEY, Mass. — Software entrepreneur Frank Dodge won't be out of the game for long, be told *Computerworld* last week in the wake of his abrupt exit from the firm be co-founded and headed for 31 years.

And when be returns, the former president of mainframe software firm McCormack & Dodge, said it will once again be at the helm of a Massachusetts-based software company.

Which one, however, is still up in the air. Dodge said that details would be forthcoming in anywhere from several weeks to several months. While another start-up ranks prominently among the options be will be weighing, be said, "I'm really considering everything. If some interesting company is looking for someone to run it, well . . ."

Not where it's at

Dodge said his future company will decidedly offer software, albeit probably not to the mainframe market, "which clearly isn't where it's at anymore."

It isn't where *he* is at anymore, either — a situation that "all happened so quickly, my head is still reeling," Dodge said.

As be plans his next firm, M&D users and employees continue to ponder the probable fate of his last one. Last fall, The Dun & Bradstreet Corp., M&D's corporate parent since 1988, bought M&D's longtime arch-rival, Atlanta-based Management Science America, Inc. (MSA). The merger of the two into a division to be known as Dun & Bradstreet Software is now under way.

"What I'm worried about in this merger is what will happen to M&D's inventory" package, said Stephen Wallis, manager of purchasing services at Lee Memorial Hospital in Fort Myers, Fla. The hospital is a beta-test site for the new M&D package, originally slated for release next month — a release date Wallis now finds uncertain.

Dodge *plans to head another software firm*

Ironically, Wallis said, his company chose to go with M&D over MSA on the basis of product functionality and sales style. Eventually, be added, be might become concerned over which company's style will prevail in the new D&B Software division: "For now, we're just trying to get the beta testing done."

M&D spokesman George Cohen last week reiterated D&B's commitment to maintaining both companies' product lines, toward the goal of an eventual merged and co-developed offering.

"This isn't just a company line," Cohen said. "It's what is going to be done."

Dodge's sudden departure in the wake of equally confirmed corporate assurances that both he and MSA President John Imlay would remain with D&B Software in high, comparably influential executive roles could lend a tarnished light to otherwise user-comforting statements such as Cohen's, several observers noted last week.

However, said Bernard Goldstein, senior partner at Fort Lee, N.J.-based mergers and acquisitions investment banking firm Broadview Associates, it should not. "Let's be practical," be said. "In the long run, a company can't exist as a two-headed Hydra. When D&B named John Imlay chief executive officer of the new company, Frank Dodge was on a personally selected exit path."

Some M&D employees, skittish from the recent experience of mass layoffs in their industry and in their state, fear for their jobs and viewed Dodge's leaving as the end of an era in more ways than one.

"This was the best company I ever worked for," said one former employee last week. "Frank Dodge had a lot to do with that."

Apple prunes its staff, handing 400 their notices

BY JAMES DALY
CW STAFF

CUPERTINO, Calif. — The layoff ax finally fell at Apple Computer, Inc. last week as about 400 employees were summoned to individual meetings and told their jobs had been eliminated.

Chairman and Chief Executive John Sculley warned last month that the cutbacks would be an integral part of a company-wide austerity plan that has been spurred by a recent period of sagging profits and flat domestic sales.

The cuts, which amount to about 3% of the worldwide 13,500-member work force, were on the low end of some analyst projections. Some forecasters had projected the loss of as many as 600 to 800 positions. Sculley said the relatively small number of layoffs was possible because Apple has reduced costs by consolidating facilities, curtailing discretionary spending and getting rid of many contractor services.

Laid-off employees will continue on the payroll for 60 days, when they will become eligible for severance pay based on their length of service. During this period, the dismissed employees will be excused from their previous duties. "Their job is to find another job," Sculley said.

Despite the cutbacks, Apple officials said hiring will continue in specialized areas such as research and development, U.S. sales and certain sectors within Apple Europe and Apple Pacific.

The layoffs are the third in Apple's 13-year history. The largest occurred in 1985 when 1,200 staffers — or approximately 20% of the work force — were let go.

Sources inside the company said many workers were somber but relieved that the waiting game is over. But some analysts say deeper problems need to be addressed. "There is something to be said for trimming down staff, but there are still many larger managerial problems that must be addressed regarding how they got so large in the first place," said Charles Rothchild, an analyst at the Jersey City, N.J., office of the Pershing & Co. market research firm. Apple's total employment grew by approximately 34% last year, company officials said.

Much of that growth occurred in Apple USA, where President Allan Loren recently resigned amid a shake-up that brought former Apple Europe head Michael Spindler to the newly reopened position of chief operating officer. Reports have also surfaced that Apple Products President Jean-Louise Gassee is considering resignation.

Sculley's announcement was only a few days after be reportedly distributed a message to employees warning that the party is over at Apple and that extravagant celebrations that have become part of the company's colorful history "definitely need to change" in the light of recent cutbacks.

Sculley also reportedly defended a recent series of signing bonuses and large payments for departing executives, often called "golden parachutes," that has come under fire in the wake of Sculley's call for financial vigilance.

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Digital NEWS

BENCHMARK FIGURES UNVEILED — A report of audited benchmark figures from relational database gurus Codd & Date Consulting Group of San Jose, Calif., shows that Oracle Version 6.0 runs 56 transactions/sec., compared with Rdb's 30.6 transactions/sec., on a VAX 6360. Tom Sawyer, Codd & Date senior consultant, was the auditor of the report.

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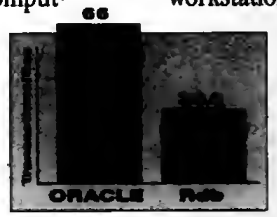

Rdb is slow on VAXs. If you find that news disturbing, consider this: Rdb doesn't even run on DEC's newest line of fast, inexpensive workstations and servers.

The choice is yours. Stay with Rdb and look into the price of a second VAX. Or call Oracle and save both time and money. Register for the next free Oracle seminar in your area, and we'll send you a copy of the Codd & Date audited benchmark report.

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COMPUWORLD

Sprint probe hovers over FTS-2000

Contract still on track despite inquiry by FBI into federal bid charges

BY JOANIE M. WEXLER
CW STAFF

Deployment of the Federal Telecommunications System 2000 (FTS-2000) network remains on track despite the looming specter of a Federal Bureau of Investigation inquiry into whether U.S. Sprint Communications Co. illegally obtained confidential data about competing bids that helped it win part of the multibillion-dollar federal voice and data communications contract.

The facts surrounding the inquiry, which is based in part on allegations that Sprint tapped into a federal computer to get the competitive information, are so sketchy that the General Services Administration (GSA) — the federal agency in charge of the FTS-2000 — is "going full-speed ahead" with the project to link all federal agencies on one network, according to GSA spokesman Bob Fiser.

In December 1988, Sprint was awarded 40% of the contract, which could be worth anywhere from $4.5 billion to $25 billion over 10 years, Fiser said. The other 60% of the contract went to AT&T.

The third-place contender was the team of MCI Communications Corp. and Martin Marietta.

In a prepared statement last week, an FBI spokeswoman refused to confirm or deny whether a full investigation was under way but acknowledged that the agency has "received allegations about possible irregularities in the confidential bidding process." She said an inquiry is being conducted to determine whether a full criminal investigation is warranted.

The hint of possible fraud emerged in August when a departing Sprint employee made "vague allegations" that inappropriate bidding information had been obtained, said Sprint spokesman Syd Courson.

According to Courson, Sprint conducted an internal investigation at that time and concluded that the complaints represented nothing more than sour grapes on the part of a disgruntled employee.

Sprint picked up the investigation again in October when it received a call from an FBI agent that stated there had been a complaint about the carrier allegedly breaching the GSA's computers, Courson said.

However, the organization "could find no validity to the complaint," Courson said. The FBI called Sprint again in late January, and at that time, the carrier handed over the documents supporting its own investigation to the FBI.

Protected information

The latest inquiry, according to Courson, may have been prompted by a lawsuit filed against the company, but Sprint is not sure because of a "whistle-blowing" statute that protects employees who file confidential complaints about fraud in government contracting for 60 days.

Both Sprint and the GSA said they are confident that no evidence of fraud will be unearthed from the inquiry.

In a worst-case scenario, said Mike Goldstein, director of communications technology at IDC Washington, Inc., a research firm in Vienna, Va., if any wrongdoing was found, the GSA could start over with the FTS-2000 procurement process, which could delay implementation of the project for another 12 to 18 months if a new vendor was chosen.

Fiser said be was unable to speculate how much such a delay would cost the government.

The voice portion of the Congress-mandated FTS-2000 is slated for completion in July. The ninth cutover, which will bring another 55 locations onto the network and render it 50% complete, is scheduled to be finished March 5.

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Cray companies jockey for position

BY ELLIS BOOKER
CW STAFF

COLORADO SPRINGS — The supercomputer slugfest will commence later this year when Cray Computer Corp. delivers the first prototype of its Cray-3 supercomputer. In the opposite corner, Cray Research, Inc., the Minneapolis-based market leader from which Cray Computer was cleaved nine months ago, said a prototype of its next-generation machine, the Cray Y-MP/16, will be manufactured sometime next year.

Both firms, which expect to bring their 16-processor machines to the market at $25 million to $30 million in 1992, are delicately jockeying for position in the high-stakes, high-end supercomputer arena — where computers cost tens of millions of dollars and the typical user is a governmental agency. Perhaps for this reason, few details about the Cray-3 or the Cray Y-MP/16 have been officially announced by either company.

Cray Computer was formed last year when Cray Research co-founder Seymour Cray agreed to spin off the development of a gallium arsenide-based semiconductor architecture as a separate company.

"Ours is a revolutionary approach with gallium arsenide as opposed to an evolutionary approach with silicon," said Cray Computer President and Chief Executive Officer Neil Davenport.

An alternative to silicon, gallium arsenide chips are theoretically capable of five or six times the speed of those made of silicon. For practical purposes, however, Davenport expects a performance improvement of three times that of silicon. Another benefit of gallium arsenide is that it requires about one-third of the power and can withstand higher temperatures than silicon devices.

If all goes as planned, the 16-processor Cray-3 will have a 2-nsec clock and, if analyst estimates are correct, will achieve a performance of 16G floating-point operations per second.

However, a spokesman for Cray Research cautioned that such estimates are imprecise and are simple extrapolations of a peak performance that assumes 100% scalar code. Most applications, he said, will involve a mixture of scalar and vector code.

The same spokesman, however, went on to promise that Cray Research's newest machine will be "roughly comparable with" Cray Computer's and said the average performance of the 16-processor Y-MP/16 will be 100 times that of the company's first platform, the now-discontinued Cray-1.

Challenge for both

No matter which one creates the faster computer, analysts noted that both Cray companies will face specific challenges in the future.

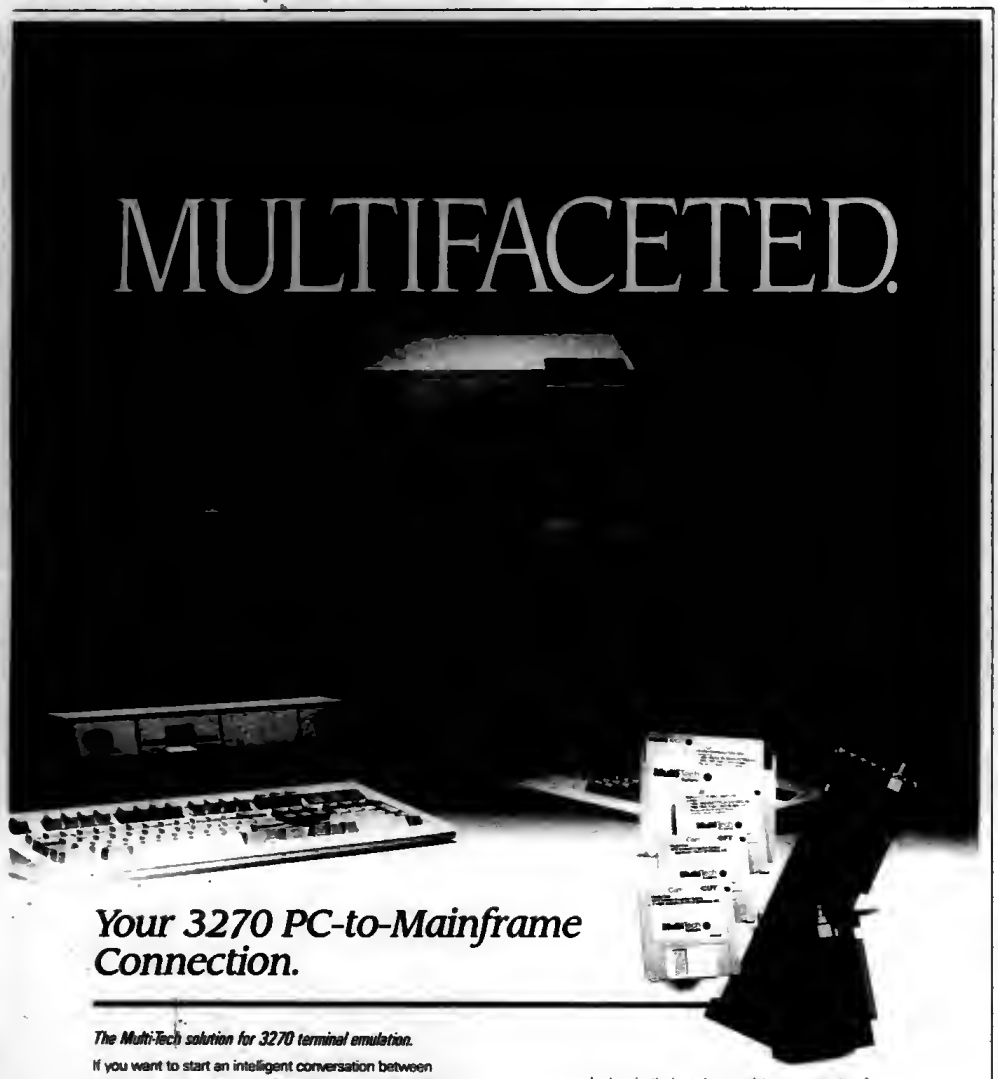
"If there's an obstacle [for Cray Computer], I don't think it is technical but financial," said Jeff Canin, an independent analyst in San Francisco, adding that the company needs to "hit its manufacturing targets" to keep its investors satisfied.

Meanwhile, Canin said he believes that Cray Research will defensively target the low end of the market to guard against losses at the high end to Cray Computer and others.

According to Canin, Cray Research will likely have computers for the "$1 million to $2 million price range" over the next year or so.

Cray Research has confirmed that this year it will introduce an "entry-level," air-cooled version of its Y-MP/16 CPU. Cray Research said the unit, to be priced from $2 million to $3 million, will far surpass the performance of its existing product in this price class, a liquid-cooled version of its X-MP CPU.

A logical market for the Cray-3 will be the 25 or so existing users of the Cray-2. The two machines share a similar architecture and, according to Cray Computer, will be instruction-set-compatible.



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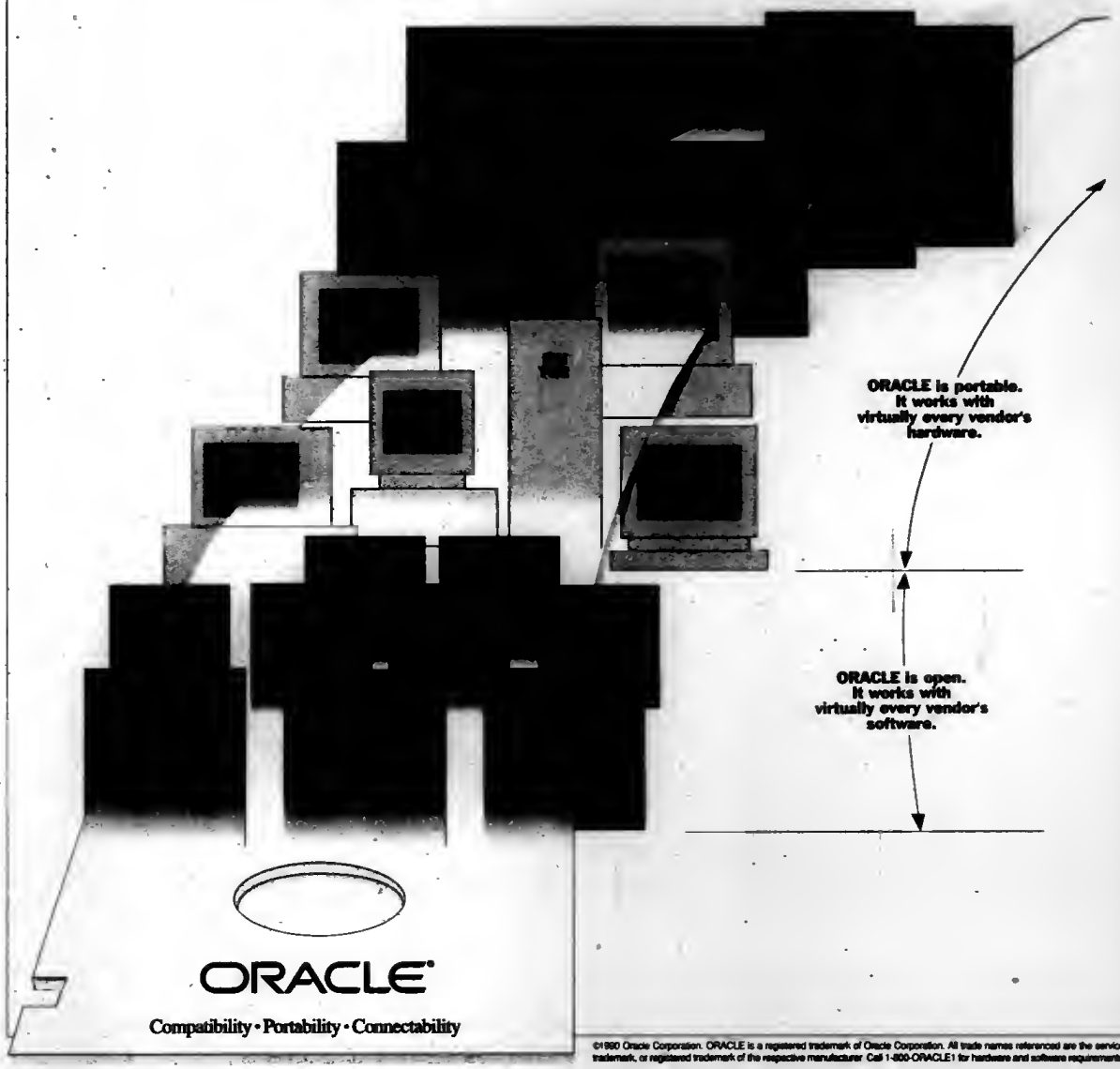

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Making room at the top for EIS

BY ALAN J. RYAN
CW STAFF

NEW YORK — Alan McClurg had it easier than some when his bank wanted to put an executive information system (EIS) in place.

As the driving force behind the project, the chief financial officer offered this bit of wisdom as justification: Why spend hundreds of thousands of dollars to put technology in front of tellers who earn $5 an hour but not in front of executives who earn more than $100,000 a year?

McClurg, vice-president of support systems at Society National Bank in Cleveland, added, "If you don't have a corporate sponsor, do not try to do an EIS. It cannot be driven by the information systems department."

The days of EIS as a novelty item to be flashed at executives — who then demand to have it — are on their way out, according to attendees and speakers at "Executive Information Systems: Mobilizing Corporate Information as a Competitive Weapon," a conference sponsored by Infoline. While they predict that more and more companies will move to EIS for competitive reasons in the 1990s, the expense of such a move will have to somehow be quantified.

"In the business environment of the '90s, companies that do not have a viable executive decision support system, of which EIS is a part, will be at a severe competitive disadvantage," said William Trotter, director of the Institute for Global Business Strategy at Pace University and principal at Strategic Management Consulting.

Justifying the system, however, is no easy task. If implemented properly, EIS can offer its users improved delivery of time-valued information, improved understanding of the business and will literally affect the kinds of decisions being made at a company, according to Paul McDonald, a consultant at Unisys Corp. in Cambridge, Mass.

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Not so easy

However, there is no simple way to quantify the value of a better or speedier business decision, according to Michael Wilkinson, director of Ernst & Young's Executive Information Systems practice in the Southeast. If a business decision needs to be made within a given time frame, he said, it is made. The use of an EIS may help the decision process by providing more easily accessible information.

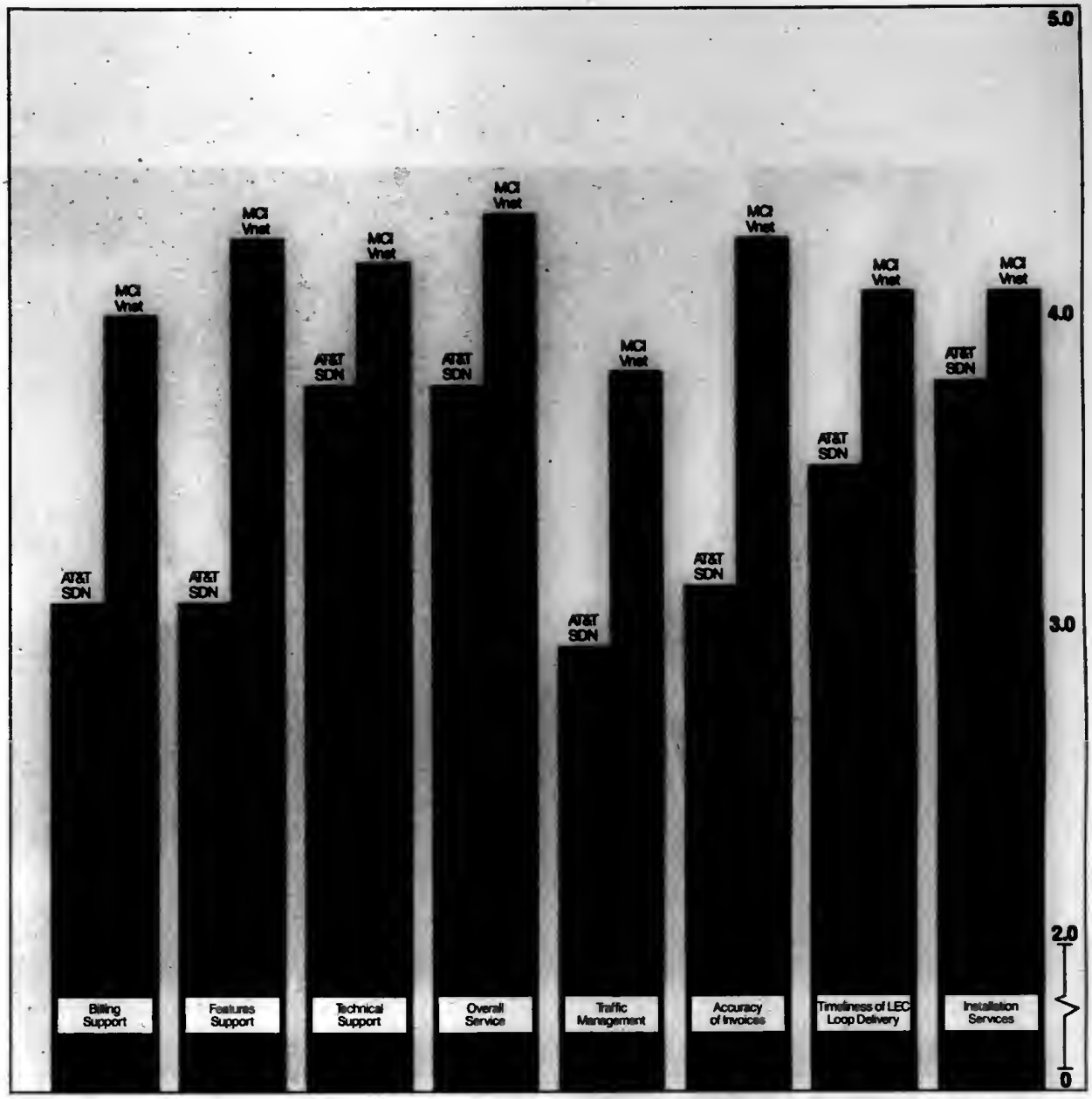
Most companies routinely try to justify the obvious expenses associated with an EIS. "Hardware and software are only the beginning but are probably what you'll have to justify," McDonald said. But the hardware and software combined will usually amount to only 50% of the total of a new EIS implementation in its early stages, with personnel costs accounting for the other 50%. By the time the system is fully in place, the personnel costs may rise as high as 80%, he added.

McClurg said that at Society Bank, the total cost of its EIS ran to $1.2 million, which included the price of an IBM 9370 host computer, 40 executive workstations (mostly Intel Corp. 80386-based personal computers with Video Graphics Array cards and Hewlett-Packard Co. color printers), training, Pilot Executive Software's EIS software and internal development.

The system in place at Society Bank, McClurg said, was not built for just one executive but rather for a team of executives.

A problem with an EIS, said Douglas Ewers, a principal at Index Group, Inc. in Cambridge, Mass., is that executives do not really want them. What they really want is an end result; the EIS is merely the physical box that can provide it.

"A successful EIS supports a critical business change successfully," Ewers emphasized. "That change usually fits into the larger picture of what is going on in the organization."



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ADVANCED TECHNOLOGY

TECH TALK

Michael Alexander

Creativity on a disk

Where is a bright idea when you need one? Well, if you have a personal computer equipped with the new breed of software that promises to help you expand your mind creatively, a good idea may only be a few keystrokes away.

That's the promise of Idea Fisher from Fisher Idea Systems, Inc. and Mind Link from Mind Link, Inc., two software packages that aim to help you generate fresh ideas or creative solutions to problems. Idea Fisher, which I ran on an Apple Macintosh but which is also available for MS-DOS machines, is essentially a database of thousands (7M bytes' worth) of words, phrases, familiar concepts and more.

Idea Fisher allows you to make associations between topics that may not readily come to mind by first asking you a series of questions. From your responses, the package culls words and phrases that are then checked against those in a database.

I also recently had the chance to try Mind Link, an Apple Hypercard stack that makes promises similar to Idea Fisher's. Mind Link also helps you make associations between words and phrases that are not readily apparent. The company calls this process of juxtaposing two or more divergent thoughts "triggering."

The package is not as expansive (it takes up 1M byte on a hard disk) or diverse as Idea Fisher, but it was considerably easier to use. It came with a curious little bag of stuff: a marble, a tiny plastic elephant and other toylike objects. This unusual collection of disparate objects also helps you trigger new ideas, the software's publishers say.

Either Idea Fisher or Mind Link can be a useful thinking tool for marketers, copywriters, journalists and others who must often work with creative ideas. Both take some effort to learn and use, and there are certainly times when scribbling ideas or diagrams on a notepad will be much more effective.

Alexander is *Computerworld's* senior editor, advanced technology.

Rendering lifelike images in silicon

A new breed of design products can create realistic depictions of product concepts

BY MICHAEL ALEXANDER
CW STAFF

The way a product looks can often be more important than the way it works, at least as far as many consumers are concerned. New car buyers relate as much to the way a paint job reflects light or to the sweep of a rear spoiler as they do to what is under the hood, for example.

While engineers have had computer-aided design (CAD) tools to develop the inner workings of prospective new products, industrial product designers, who are responsible for a product's appearance, have not been so lucky.

What product designers have been clamoring for is an electronic drawing board that would enable them to make realistic renderings and mock-ups of prospective new products and change designs at will.

"If a picture is worth a thousand words, then a mock-up must be worth a thousand pictures," said John Houlihan, director of industrial design at Timex Corp. However, high-quality mock-ups are costly, and it is not uncommon for them to be modified as they make the rounds past marketers, engineers and everyone else who is involved in the product design process. What was difficult to judge in a sketch is now glaringly obvious in the mock-up, he said.

Filling in the details

Until now, industrial product design on workstations has been severely hindered because the images have merely been crude simulations of what the final product might look like. What has been missing are the textural details and other bits of visual information that make designs appear lifelike.

However, there are now some 20 companies on the market touting software that can turn out images on workstations that appear as realistic and sharp as photographs.

Computer-generated pictures are made in two steps: The first is creating a model consisting of the basic geometric building blocks or skeleton of each object. The second is rendering, which consists of adding the surface characteristics — the texture, shading and glints of light, for example — that are so important to realistic design.

Many of the packages now on the market have both modeling and rendering features (although there are quite a few that only do one or the other). As might be expected, some packages are better for modeling and others for rendering, but there are precious few that are good for both tasks.

Pixar, Inc., which won an Academy Award in 1988 for its animated film using realistic computer-generated images, is touting its Renderman interface as a standard that would make it possible for designers to use one company's modeling program with another's renderer. The company also markets Photorealistic Renderman, its own rendering software.

Photorealistic rendering *gives designers the ability to create and modify true-to-life images*

Pixar claimed a standard interface between three-dimensional modeling and rendering software would do for CAD what Adobe Systems, Inc.'s Postscript language, which linked Apple Computer, Inc.'s Macintosh and Laserwriter, did for desktop publishing.

At least 15 companies have signed up in support of Renderman, although only Cadkey, Inc. has actually introduced a product.

However, publishers whose software offers both modeling and rendering features counter that there is little need for a standard. Those companies that have endorsed Pixar's standard lack the expertise to develop a rendering package on their own and thus are more interested in acquiring the capability elsewhere, an executive at one company said.

"It's a good argument in principle but impossible to implement because of the many variables from beginning to end" in generating color images, said Arthur Bell, vice-president of marketing at Alias Research, Inc. His company markets a modeling and rendering package that is used at General Motors Corp. and Timex, among other firms.

Most software for creating photorealistic images is designed to run on the sorts of workstations made by Sun Microsystems, Inc. and Silicon Graphics, Inc., operating at a rate of 10 million instructions per second (MIPS) or more.

Personal computers, even though they are equipped with math coprocessors and Intel Corp.'s speediest microprocessors, lack the horsepower for big business production rendering, several publishers said. "A poster-size image takes up 50M bytes of storage space," Bell said. "Try to move that through an AT bus."

A basic system with software for 3D modeling and rendering and hardware to run it starts at $40,000. The software is typically about half the price of the entire setup.

The computer-aided industrial design market will take off in a big way when hardware catches up with the capabilities of the software, publishers predicted. The tools are there, but designers have not been able to exploit them fully because rendering remains brutally slow, even on high-powered workstations.

It takes about 30 minutes to compute one frame. It takes even longer to render designs, for example, that an automotive designer might typically do with the smoothness, crisp edges and gleaming chrome that the auto industry's design processes demand.

However, there has been considerable progress made toward the goal of rendering designs in real time, considered by most designers to be the brass ring of computer-aided industrial design. "Eighteen months ago it took 10 hours to compute one image," Bell said. To compute an image of a new car design now typically takes about an hour.

Bell predicted that computer systems capable of generating images in real time will be on the market in approximately 18 months for $200,000.

At Timex, designers are already reaping benefits from the technology, although they have yet to "really dazzle" anyone, Houlihan said. What once took three weeks in the design process can now be acccomplished in three days, he added. With the crush of competition and the urgency to push products from drawing boards onto retail shelves, the benefits of electronic mock-ups cannot be ignored.

"Being able to rework a design — that is the neatest thing about this," Houlihan said. "There are things that we cannot do any other way."

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EDITORIAL

More for less

IF THE 1980s were the decade of desktop computing, then the early '90s are shaping up as the age of price/performance. That may have some very far-reaching consequences for the entire industry.

IBM's RS/6000 announcement has generated the requisite oohs and ahs for its zippy performance and $800-per-MIPS price point. The subtle problem for IBM and other major proprietary vendors is that products such as the RS/6000 are real competitors to minicomputer and, potentially, mainframe lines.

True, a reduced instruction set MIPS is nothing like a 3090 MIPS, but users are nevertheless discovering that they can waste an awful lot of power with RISC machines and still have plenty left over. With every new RISC introduction, it seems we hear more users saying, "Boy, now I don't have to upgrade my mainframe!"

Well, more power to them. And heaven help the mainstream hardware vendors who will try to hold a proprietary edge in a world that increasingly doesn't give a hoot.

One refreshing trend of the last few years is that market-savvy users are going their own way when it comes to deciding where computing power should reside and who should use it. IBM will undoubtedly try to keep the RS/6000 within the narrow scientific and technical realm to avoid real damage to its AS/400 and 9370 lines. DEC did the same thing a year ago but learned the hard way that it couldn't force users to walk down the proprietary VMS path when the allure of RISC/Unix power became too great.

It is the customers, not the vendors, who are increasingly deciding which architectures are appropriate for a commercial setting and which aren't. Unix is still far from shedding its image as an arcane operating system, but it is the environment of choice on these speedy little workstations and servers. With RISC price/performance options becoming so attractive, we may again see hardware power begin to drive users' software decisions during the next couple of years.

Unix's future is also brighter. Rival camps are settling differences; improved interfaces are closer to reality; and Unix has become the hot market for transaction processing. The more momentum the Unix workstation train picks up, the more the old guard will be left at the station. Is it any wonder that such industry stalwarts as Data General, Unisys, Bull and NCR have embraced open standards?

It would be nonsense to predict that Unix will quickly rev up and pass MVS or VMS as the commercial computing environment of choice; things simply don't move that fast. But the new class of technical powerhouses is giving IS managers a new reason to give Unix a second look.

For IS managers, this is good news. Vendors who play in an open standards arena must compete on features, service and performance. The RISC wars have given us the pleasure of watching companies not associated with technical innovation beat each other up trying to provide more for the money. Who could ask for more?

LETTERS TO THE EDITOR

A clear memory

I enjoyed the interview with Jay Forrester [CW, Jan. 15], one of the great figures of our amazing trade. I worked for Forrester and Bob Everett in 1951 and 1952 as head of the logical design research group at Whirlwind and indeed remember the malevolent MIT match department and especially Nasty Norbert, as I christened him at the time. I warmly remember the good offices of Gordon Brown, head of the electrical engineering department.

However, the interview leaves the wrong impression about the adoption of core memory. Forrester says, "It took us about seven years to convince the industry that [core memory] was a good idea and ought to be used in computers." Even if the readers take this to mean from 1949, when the idea came to Forrester, and not from its first publication in the *Journal of Applied Physics* (1951) or installation in Whirlwind (1953), it is just not true.

Gene Amdahl was planning on core for the IBM 704 (then called the 701A) from the fall of 1953. The machine was announced to a "class" of IBM 701 customers in Endicott on May 6, 1954. Firm prices were announced, and the "Oklahoma land rush" to place the 704 were orders initiated on Oct. 1, 1954.

I took delivery of the No. 3 machine the following March — the first one with two boxes of core. Each box had a footprint about 3 by 5 feet, stood 6 feet high and weighed at least a half ton. (The power supply was elsewhere!) The box was called the 737 and stored 4,096 36-bit words, or 18K bytes in today's terminology.

The monthly rental of the first box was $6,100. After the 1956 consent decree, when IBM agreed to sell as well as rent its machines, this worked out to something over $12,000 per kilobyte. Times have changed!

Herb Grosch
Mies, Switzerland

Alive and well

Regarding the letter by Joe Celko on your Viewpoint page [CW, Jan. 8], Ada is alive and well and in use by a growing number of federal agencies, nongovernment corporations and software developers. I have been using Ada for several years and have also taught Ada in colleges and to industry professionals.

Ada is not simply a computer language. Of course, I can train people to program Ada in the same style that characterizes Pascal, Fortran, Cobol or Jovial, but that is exactly the problem we now have: Many of the people who are teaching Ada do not actually understand it beyond the coding level.

Celko mentions the need for using assembler code instead of Ada on some systems. This criticism is primarily because of the wide use of the old MIL-STD 1750A architecture. The tiny data space and code space of the 1750A were designed without reference to Ada, and the compiler vendors had significant challenges in compensating for the frailties of that design. Several good Ada compilers are now available for 1750A.

In fact, Ada compilers and development environments are now available for nearly every hardware and operating system currently in use. Moreover, with each new release of a compiler, the choice of Ada for serious software construction becomes more appropriate.

Richard Riehle
RDR Consulting
Palo Alto, Calif.

Easy transfer

Regarding "Backed up but into a black hole" [CW, Jan. 29], Charles Lecht might give users the wrong impression that MS-DOS files still resident on older Intel Corp. 8088-based processor hard disks may be either hard to transfer off or expensive to do so (the author suggests one avenue was the purchase of an external drive that even be did not want to buy).

Actually, a very easy and more economical way of transferring files when hardware is upgraded, as is done here, is through the use of the file transfer package called The Brooklyn Bridge. Its user-friendly menu structure and ability to transfer files either via a serial port (up to 115.2K bit/sec.) or a parallel port connection makes such a transfer operation effortless. I would encourage Lecht to pull his old processor out from under the TV, try The Brooklyn Bridge and see how current software technology can extract data easily from the "black hole."

Stephen C. Rood
Manager, Microtechnology
Coopers & Lybrand
New York

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Does Unix win because of OS/2's failure?

DOUGLAS BARNEY

Say the word OS/2 in mixed company and you will quickly spot the computer users. The ones who become pig-biting mad are the users. These poor souls have had enough promises and waiting.

With increasing bitterness, users are simply giving up on OS/2 and turning to an unlikely alternative. Almost by default, the hot desktop operating system today is none other than Unix, the bulky, awkward beast of an operating system that has suffered nearly 20 years of justified scorn and ridicule.

Unix was brought back from the dead by a strange and disturbing string of events. There were dramatic changes in the desktop environment and an epidemic of vendor bungling as well as long delays in the shipment of OS/2. But the worst vendor offense of all was failing to read user needs.

To lose to Unix, you've got to mess up big, and that is exactly what IBM and Microsoft did in building and positioning OS/2.

You can't fault Microsoft and IBM for taking Unix so lightly. Virtually no one worried about Unix in the early days of OS/2 design. Unix was used by some oddball scientists and value-added resellers who sold office automation to dentists and veterinarians. AT&T was openly laughed at for its persistence.

No, salvation for MS-DOS users was never supposed to come from Unix. It was supposed to come from the cocksure pair of IBM and Microsoft, which understood its flaws better than anyone. Flushed with pride, the two companies threw out the old MS-DOS completely and set to thinking of a radical new design: full multitasking, large amounts of available random-access memory (RAM) and a graphical user interface to boot.

It would have worked, except that a collection of equally large companies was saving Unix by stressing the exact same features. These companies had names such as AT&T, Sun, DEC and HP. Maybe you've heard of them?

OS/2 is now stuck in software limbo. Microsoft gave OS/2 so many features that it is not an economic alternative to the memory-sparing MS-DOS. OS/2 is now squarely in Unix territory. Both are hogs. Newer forms of Unix, though, justify their gluttony with a host of amazing attributes. OS/2 doesn't.

Want to run MS-DOS programs? Many versions of Unix can run a range of full-blown DOS applications. OS/2, however, is confined to "well-behaved" applications that use less than 520K bytes of RAM. Like children, there are simply not enough well-behaved DOS applications.

How about multitasking DOS programs? These same versions of Unix multitask these applications quite well. OS/2 doesn't.

IBM made a critical error by not matching these features of Unix. It also took too long to write OS/2 and failed to build an adequate interim operating system.

However, these goofs pale in comparison to the Presentation Manager. The original plan was a winner. The now popular Microsoft Windows was to have been the interface for OS/2. If that had happened, we would have hundreds of graphical OS/2 applications today.

Yet, instead of simply layering Windows on top of the new operating system, Microsoft and IBM built the all new Presentation Manager. It is great technology but about as compatible with Windows as it is with a toaster. Even Windows developers had to go back to the drawing board. That is why all the decent OS/2 applications still wouldn't fill up a Yugo.

Maybe that is also why even Compaq has failed to promote OS/2, and it sells 33-MHz 80836 personal computers.

If you want applications, Unix is it. According to Unix International, a consortium of heavyweights backing Unix, there are currently some 15,000 applications that will run on Unix System 5.4. Add to that another 15,000 DOS applications that will run as tasks.

Moreover, you can run these applications on a lot of different architectures, from minis to workstations to PCs. Unix is the only system that can harness the revolutionary workstation products that are grabbing a greater number of desktops.

Meanwhile, OS/2 continues to lock users into the conventional Intel microprocessor architecture, which is rather slug-like when compared to speedy reduced instruction set computing (RISC) and multiprocessing systems. What's worse is that OS/2 only exploits the Intel 80286, a 7-year-old chip that even Microsoft has called brain-damaged.

Unix has no such problems. It seems to exploit any system it runs on, whether that be an Intel 80386, a wild RISC device or an Amdahl mainframe. Run out of steam on your Unix workstation? Get a mini. That not enough? Get a mainframe. That not enough? Get a supercomputer.

OS/2 only *promises* to exploit these architectures.

Losing a war of technology doesn't always spell doom in the computer business. But losing a political war usually does. Microsoft is outnumbered, out-

Continued on page 24

Barney is editor in chief of *Amiga World*.

BILL GATES

OS/2 will succeed. Unix will succeed. We sell them both; we love them both. Only the occasional analyst feels the compulsion to create an either/or situation, perhaps out of honest confusion or the desire to play devil's advocate.

It is a different question, though, when you ask about the office desktop, for which OS/2 was designed, for which OS/2 is being marketed and for which Unix has always had only a small role.

First, Unix. Our Xenix offering was the first Unix for microprocessors and remains by volume the most successful Unix in the world. Unix continues to grow. It has distinct niches in high-end engineering, in small vertical businesses and on the server. But Unix is not growing any faster than the personal computer market as a whole. One does not have to be anti-Unix to point out that Unix is not driving to take over the desktop. Our customers don't ask when we are going to have a Unix product; they ask when our Presentation Manager products will be ready.

Nicolas Ancin

Consider this: We have already sold more units of OS/2 during its two-year introductory phase than we have sold of Unix in nearly a decade. OS/2 is only a "failure" when compared to the enormous installed base of DOS.

The question is, why was DOS successful? Why will OS/2 be successful? The answer is simple: packaged product.

What created the PC revolution — and what Unix lacks — is a single binary standard: one instruction set, one operating system, one keyboard. DOS created a self-reinforcing PC market.

The volume effect pushed hardware and software prices down, creating more demand, bringing in more developers to make new products and thereby selling more machines — a cycle that generates fierce competition at all levels and encourages both hardware and software innovation. Today, the PC is home to not only the easiest and cheapest applications but also the best.

Unix is a different phenomenon — a successful one in its own way but a fundamentally different one. Unix runs on a variety of instruction sets. It simplifies life for companies that need the same applications running on many different kinds of computers or that want to be free to change the kinds of machines they use whenever they want.

This is an important role, but it is not a volume market by definition. (In the volume PC world, changing machines is not a concern because all the machines are compatible, and any vendor will be happy to talk to you if your current vendor is unresponsive.) Even if the diverse Unix communities finally agree on a single definition of Unix and a single user interface, Unix will still not be a binary standard. People cannot build and sell a single software product with a single machine architecture to service and support. This is what OS/2 has. If Unix has 8% of one market or 12% of another, this is not a single market share number for a single operating system and instruction set but rather half a dozen smaller numbers that get totaled together under the generic name Unix. Unix's problem is that the market is some combination of several versions of Unix: How does one distribute product in volume, and through what channels, for such a market?

Stay single

PC-style volume can come only with a single version of Unix on a single platform. This is not a technical issue but a fundamental marketing issue that must be addressed before software developers will jump aboard Unix in the kind of numbers that have already committed to OS/2. Meanwhile, OS/2 clips along with a single product for a single instruction set, gaining applications and market share. OS/2 is a single unambiguous market with the capability to develop volume and economies of scale.

OS/2 is not just another good operating system. The fact that it was designed with DOS and Windows in mind is both technically and strategically important. It was designed to create a new binary standard compatible with DOS but to allow many more capabilities. There's a natural extension of power from DOS to DOS plus Windows to OS/2 Presentation Manager. Users can come along as quickly or as slowly as they need with the same interface, the same training, the same applications — only with additional capabilities at each level. This family of systems is an important reason why OS/2 will succeed.

The final reason for OS/2's success is a fundamental one: As applications go, so goes the desktop. As applications go, so goes the operating system.

On the desktop, the cold, hard fact is that there are many, many more mainstream PC applications being written for OS/2 today than for Unix, because developers recognize that there is only one OS/2 (OEMs don't get to "enhance" it as they do Unix), that there will be a single distribution channel, and that volume will create economies of scale.

Many powerful new Presentation Manager applications are already avail-

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Gates is chairman and chief executive officer of Microsoft Corp.

Gates

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able and many more are on the way. Mr. Barney refers to "revolutionary workstation products that are grabbing a greater number of desktops" for Unix. Does he mean Aldus Pagemaker? Autodesk Autocad? Lotus Notes? Microsoft Excel? Saros Fileshare? SQL Server? All these revolutionary products are on OS/2 Presentation Manager — and all are part of the industry's strong PC heritage.

"Personal" is still a key component to personal computing. OS/2, for example, is optimized for speed of interaction with the user; Unix is optimized for overall throughput of the system — the individual may have to wait.

In the PC industry, everybody can play.

As to some of Mr. Barney's other points, they apply to Unix as well as OS/2 — only more so. The following ones are key:

- Running or multitasking DOS applications. No one in his or her right mind would buy a Unix system to multitask DOS applications. That is why people buy Windows. Users buy a Unix system because they need a particular Unix application and want to be able to occasionally use DOS applications. Check back in a year to see which system better integrates DOS applications — DOS' big brother or one of the many versions of Unix.
- It's hard to port applications from Windows to Presentation Manager, because we made an agonizing decision to put into Presentation Manager the most sophisticated graphics interface available. But there is only one graphical interface on OS/2, and it has the same programming model (and many similar commands) to that of Windows. How much harder is it going to be for developers to port to a Unix graphical interface with a totally different model? And to which Unix interface — Motif? Openlook? Nextstep? Which market will be sufficiently large enough to justify the porting effort?
- Scale. Mr. Barney speaks of users trading up from workstations to minis to mainframes to supercomputers whenever they run out of steam. This is indeed a big-system mentality, and one that is about five years out of date. PC users are much more likely to scale up in power instead through more and more powerful micros and multiple processors and to use OS/2's client/server architecture to get minicomputer power for one-tenth the price. This is the future of computing, and OS/2 was designed for it.

For years, Unix has always (in theory) been in a position to invade DOS' territory, since it had 32 bits and multitasking, and DOS didn't. Yet DOS utterly overwhelmed Unix on the desktop. That is the market momentum that OS/2 is inheriting. Now, Unix faces its technical match in OS/2, and yet the argument is that Unix will fare better. One could actually turn the argument around. DOS was not robust enough to challenge Unix in the high-end technical niche, where OS/2 is. That raises the intriguing question of which one is more likely to invade the other's turf? Just in case one wants to play devil's advocate.

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COMPUTER ASSOCIATES

Barney

FROM PAGE 23

gunned and outhyped by the gathering forces of Unix. It not only has to battle the phone company, itself a nearly impossible proposition, but also the likes of Sun, DEC and HP. Each of these companies is far larger than Microsoft, which is a relative lightweight at less than $1 billion per year in revenue.

Smaller companies that used to quietly resent Microsoft's lock on PC operating systems are now talking potshots. Everyone is talking about Unix.

Even IBM, Microsoft's OS/2 partner, is ready to mutiny if Unix gets a firmer grip on the market. OS/2 will survive and may even prosper. But it will be used largely in IBM sites with mainframes, PC networks, Systems Application Architecture on the brain and blind loyalty. The rest will shift to Unix.

Microsoft should own up to this, keep working on OS/2 but start writing for Unix — fast.

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HARD TALK

Rosemary Hamilton

Two of three ain't bad

Earlier this month, an Atlanta firm learned a hard lesson about disaster recovery.

When the Basis Information Technologies, Inc. data center was walloped by a wind and rain storm Feb. 10, the company couldn't rely on its own backup facility to provide a full production environment.

I suppose it would be easy to take a shot at Basis for this. One could point out that it is a tad silly to go to such lengths as to have a backup facility and then not be able to depend on it 100% when the time came. But that wouldn't be fair. There are probably many, many companies out there that would have found themselves in the same situation.

Of course, Basis now knows it should have had a better-equipped backup facility. But what is important to point out is that Basis had what appears to be a very solid set of disaster recovery procedures in place and a good working relationship with its primary vendor, Unisys Corp. These two factors pulled Basis out of its mess, despite the limited backup facility.

So the lesson, trite as it may

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IBM hints at AIX CASE plan

BY AMY CORTESE
CW STAFF

Amid the barrage of reduced instruction set computing workstations and servers it unleashed earlier this month, IBM slipped in some computer-aided software engineering offerings and a glimpse of its AIX-based CASE strategy.

Reflecting its broader thrust with the RISC System/6000 line, this strategy focuses on the software development needs of the scientific and engineering communities. In what seems to be emerging as a dual CASE strategy, IBM's AD/Cycle plan for its proprietary platforms will remain the development environment for commercial users.

Under that dual strategy concept, technical CASE is characterized by workstations, the client/server model and the C language. The centralized approach relies on mainframes, personal computers and IBM products that are deemed strategic, such as DB2, said Michael Thoma, vice-president of marketing at San Francisco-based CASE vendor Interactive Development Environments.

Although IBM has yet to elaborate on its CASE strategy for AIX, its Unix variant, IBM executives have said that a wide variety of software choices will be supported for its Unix-based product line. AD/Cycle, on the other hand, centers around an IBM repository and relational database management system and creates a pecking order among third-party tools.

The AIX CASE offerings unveiled at the announcement consisted of six bundled software options, each made up of third-party software tools geared toward a specific programming environment. The options, called AIX CASE Solutions, include offerings supporting small to large development projects in C, Ada, Fortran, C++ and embedded C applications.

With AIX CASE Solutions, IBM is attempting to address the full range of technical development activities from design to maintenance and project management. Atherton Technology, Inc.'s Software Backplane repository and the Teamwork CASE tools from Cadre Technologies, Inc. are paired with compilers and tools from other third parties to provide this capability.

The AIX CASE Solutions are designed to work with IBM's Motif-based AIX Windows Environment and will be tested by IBM to ensure compatibility among the components supplied by third parties.

IBM did not give pricing and availability dates, but David Butler, manager of planning and market development at Cadre, said that the offerings are currently being tested and integrated and will be rolled out throughout the year.

The technical CASE market being targeted by IBM is typically considered to involve different tools and languages than those used in commercial development, such as C and Fortran, and to employ different methodologies geared towards complex applications that are often embedded.

"The lines are blurring between technical and commercial CASE. They no longer fit into neat categories," Thoma said. "Technical CASE used to mean Unix, and commercial meant SAA [IBM's System Application Architecture]."

Sterling aims to strike gold in storage market

BY ROBERT MORAN
CW STAFF

Sterling Software, Inc. recently claimed to have taken a lead in the utilities market when it announced that its forthcoming system-managed storage software will be able to fortify IBM's Data Facility Storage Management System (DFSMS).

According to the company, which is based in Rancho Cordova, Calif., the Storage Automation Management System (SAMS) will monitor activity and conditions within the storage environment and initiate storage administration tasks performed by its various storage management components.

Sterling said that the new system integrates its current product line and contains a subsystem, called Automatic Initiation Manager (AIM), which automatically triggers user-defined actions across the product line — a disk management system called the Data Management System (DMS/OS), volume allocation management products called VAM/VSAM and VAM/DS and on-line data compression software called Shrink/MVS.

In addition, the company will deliver View, a graphical user interface that runs under DOS on Intel Corp. 386-based personal computers and provides visual interactive control of the storage environment.

Sterling is promoting SAMS as an alternative to IBM's Data Facility Hierarchical Storage Manager and Data Facility/Data

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Inside

- IS isn't leisurely at Clubcorp's FMC. Page 31.
- Imaging systems are beginning to hit their stride. Page 31.
- Unisys' new chip is another Scamp. Page 34.

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The third is file journaling for safeguarding information whenever you enter it on the system. All transac-

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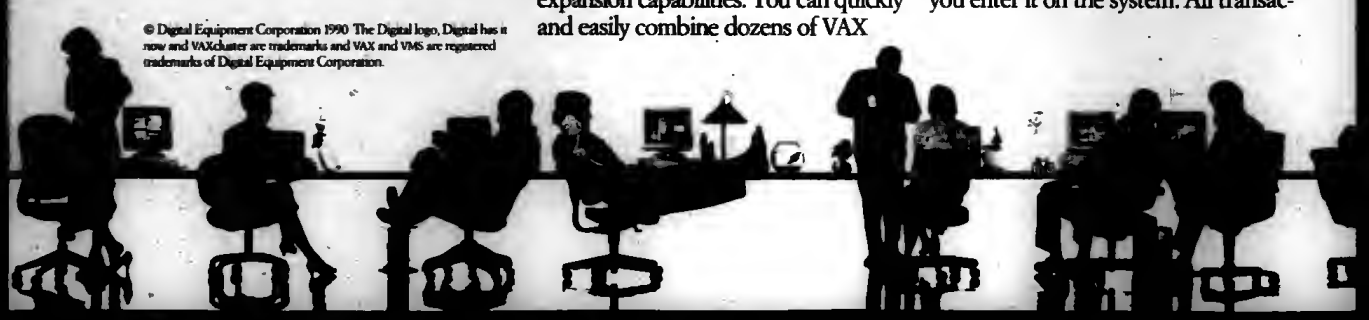

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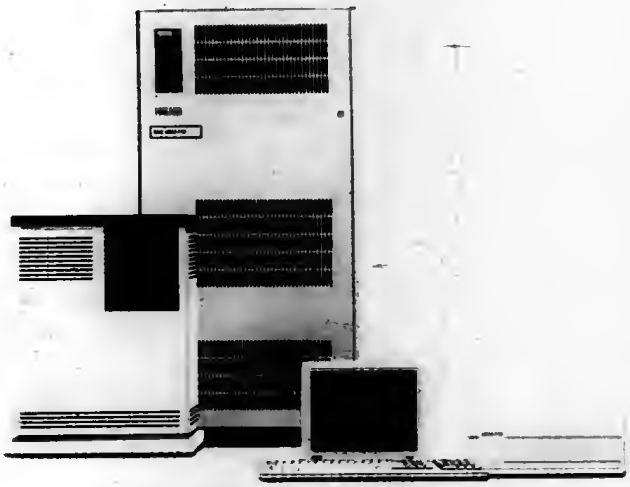

tions are recorded in a temporary file. If the system is interrupted, you can use the journal file to update your database to its correct state.

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Processing Topologies Supported						
Peer-to-Peer Processing	✓			✓		✓
Existing terminal-based systems	✓	✓	✓		✓	
Mixed Peer-to-Peer and existing systems	✓					
Application integrity/Software Distribution	✓		▬			
SAA/CUA Interface compatibility	✓	✓	▬			
Workstation Environments Supported						
PC/DOS	✓	✓	✓	✓	✓	✓
OS/2	✓	✓	✓	✓	✓	✓
PC/DOS to OS/2 application compatibility	✓		?			
LAN Server for shared applications and data	✓		?			
Multiple transaction servers on a LAN	✓					
Development Environment Comparison						
Object orientation	✓	▬				
Dictionary and documentation	✓					
Panel/Form painter for creation/maintenance	✓	✓	▬			
3270 screen capture, picture and attributes	✓					
CASE/Application Generation	✓	✓				
Intelligent (language-sensitive) editor	✓					
System and user-defined reusable code templates	✓					
Integrated compile/test/debug	✓	✓				
Execution time source debugging	✓	▬				
All development tools for DOS available in DOS	✓		✓			
Objects Supported						
CUA display images	✓	✓				
CUA dialog within display object	✓					
Validation within display object	✓					
Help processing	✓					
Error processing	✓					
Text window interactions	✓	▬				
Business graphics	✓	✓				
3270 definition	✓					
Interactions with 3270	✓					
Interactions with Peer-to-Peer	✓					
"Logon" Scripts	✓					
Application integrity/Software Distribution	✓					
Local Data Access						
Indexed files	✓		✓			
dBase	✓		✓			
Flat Files (random access)	✓					
Flat Files (sequential access)	✓	✓	✓			
Multiple read/write to files on LAN Servers	✓					
High Level Functions Directly Available in the Language						
Field-level context sensitive help	✓		✓			
Optional user learning mode	✓					
Display and selection from:						
Indexed files	✓		✓			
Sequential files	✓	✓	✓			
In-memory lists	✓	✓	✓			
Menu display and selection	✓		✓			
Determining 3270 screen identification	✓		✓			
Read/write to 3270 in a single command	✓					
Read/write to 3270 one field at a time	✓	✓	✓			
Determine dynamic 3270 attribute changes	✓					
Embedded user assistance (pop-up selection lists)	✓					
Data editing validation						
Data type mask checking	✓		✓			
Single range limit check	✓		✓			
Field-data driven range limit check	✓					
Date formatting validation	✓		✓			
Validation against local and LAN files	✓					
Required fields	✓		✓			
"Must Fill" fields	✓					
Zero not valid fields	✓		✓			
Peer to Peer Host Environments Supported						
MVS-CICS	✓			✓		✓
MVS-IDMS/DC	✓					
MVS/TSO	✓					
DOS/VSE-CICS	✓			✓		
VM/CMS	✓			✓		✓
DEC VAX/VMS	✓					
Software Distribution Host Environments Supported						
MVS-CICS	✓		✓			
MVS-IDMS/DC	✓					
MVS/TSO	✓					
DOS VSE-CICS	✓					
VM CMS	✓					
DEC VAX VMS	✓					

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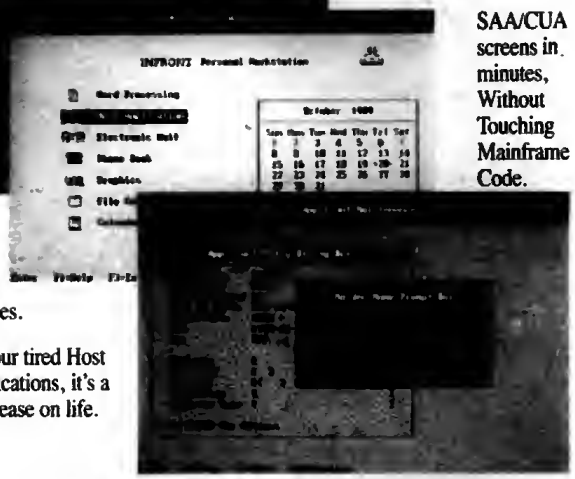

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There's a flip side to frivolity

For Clubcorp managers, information processing is no day at the beach

ON SITE

BY ROBERT MORAN
CW STAFF

To its 225,000 members, Club Corporation International means leisure, but for Clubcorp's financial and information subsidiary members, there is a serious side to business.

"What we process is information that shows our controllers all the strategic indicators of the operations," said Dan Barth, MIS director at Financial Management Corp. (FMC) in Dallas.

With the information, officials in four regional offices are able to keep budgets in line but can also identify oportunities for expansions, club acquisitions and new services, according to Barth.

FMC processes information from approximately 185 individual local country, dining and health clubs under the Clubcorp umbrella.

The firm uses 165 IBM System/36 minicomputers to post information to an IBM 4381 mainframe, and financial personnel in the regional offices snatch and analyze it on IBM Personal Computers. But before information reaches the PCs, it is fitted into meaningful form by software from Computer Associates International, Inc.

In the first step, FMC gleans information from the System/36s at the individual clubs and sends it in a batch program to general ledger software from McCormick & Dodge running on the IBM 4381. Once the general ledger is closed and reconciled, Barth said, it is summarized by an FMC-built application into about 100 indicators and stored within the CA-Datacom/DB running VSE under VM on the 4381.

FMC runs two databases critical to Clubcorp operations on CA-Datacom/DB. A membership database contains information on every member of Clubcorp, including information about their spouses, children, spending habits and hobbies.

Record breakdown

The financial database contains four years of club history and club budgets divided into 13 periods per year. Furthermore, the 100 indicators are divided at the club level by region and by type of club within a region, according to Barth.

However, the mainframe serves two other purposes, operating as a communications facility and as a disaster recovery backup.

The 4381 running CA-Datacom/DB under VSE serves as a concentrator of information that is pulled from distributed System/36s using a combination of dial-up lines, in-house developed dial-up communications and compression software. According to Barth, the dial-up software automatically polls each System/36's membership database once each month.

Barth added that FMC will eventually exchange the System/36s for IBM's Application System/400.

The compression software has reduced the amount of long-distance telecommunications charges that are incurred by FMC by 70%, according to Barth.

several strategic applications that allow controllers to key into the CA-Datacom/DB database and track the number of members that have been added and deleted.

The four regional offices use either CA's Dataquery/PC for ad hoc queries or CA-Datacom/PC for downloading data necessary for analysis over leased lines.

Using a CA-Datacom/PC pro-

Stan Wakeman

Clubcorp's Barth *is keeping IS up to par*

The company also uses the software to download program fixes to the midrange computers, a capacity that has become an integral part of FMC's disaster recovery strategy.

"If we have a flood or a hurricane and a club house is destroyed, we can quickly rebuild the System/36 database by extracting information from the CA-Datacom/DB database," Barth said.

Information about each of the company's clubs can be recaptured easily because it is identified by a three-digit number and then downloaded from the mainframe, he said.

In addition, using the CA-Ideal fourth-generation language, FMC has built what Barth called a PC-based executive information system that allows controllers to key into the CA-Datacom/DB database and track the number of members that have been added and deleted.

The four regional offices use either CA's Dataquery/PC for ad hoc queries or CA-Datacom/PC for downloading data necessary for analysis over leased lines.

Using a CA-Datacom/PC procedure, regional office PCs automatically log on, download and store data as well as export it to a spreadsheet — a process that formerly required manual entry.

Further, any regional controller who notices a discrepancy between expenditures within his region and the mean expenditures in the other regions can, for example, use CA-Dataquery/PC to pinpoint items that have exceeded budget, according to Barth.

CA-Dataquery/PC helps the controllers keep up with a dynamically changing industry, Barth said.

"With it, we can give the controllers flexibility," he said. "Instead of writing an application, we can give them a tool."

Imaging pioneers eye RDBMS developments

ANALYSIS

BY JEAN S. BOZMAN
CW STAFF

Image processing has been on the periphery of information systems for more than a decade, slowly moving into the mainstream.

However, expected developments with relational database management systems could quicken the pace.

Provided that RDBMSs get "smart" about images, vast horizons of new applications could open up, said Tom Sawyer, a senior consultant at Codd & Date, Inc. in San Jose, Calif. "It's just like the situation that prevailed when the telephone was invented," Sawyer said. "People had no idea how much use you could make of the new invention. Today, it's obvious."

The promises of imaging technology are great — employee productivity gains doubled, floor-space reductions cut in half, and transaction times cut in half, according to consultants.

An industry survey of more than 400 large user organizations by Nolan, Norton & Co. in Lexington, Mass., last year showed that 32% were planning an imaging system pilot, an equal number were thinking about it, and 14% were installing an imaging system. However, only 2.5% had incorporated imaging into their IS architecture. The same study found that worldwide hardware sales of imaging systems would jump from an estimated $1.2 billion in 1990 to $4.5 billion by 1992.

However, the bulk of the IS community appears to be waiting for cost reductions and more

Continued on page 32

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THE SYBASE SEMINARS

Imaging

CONTINUED FROM PAGE 31

technological breakthroughs before committing to imaging, vendors and analysts agreed.

"No matter how grand and glorious the pictures are, you have to have good performance in your imaging systems," said Gilbert Wai, director of product marketing at Informix Corp. "The quality of the system won't matter if you have to take a coffee break every time you retrieve an image."

Some relational DBMSs, including Informix's Online RDBMS, can handle digitized images, video or voice as part of the data-and-text RDBMS, storing these multimegabyte files as binary large objects (BLOBs). The BLOBs are strings of 1s and 0s, as digitized by document scanners. Designers of today's databases store labeling information separately as text. Other RDBMS vendors that support image retrieval are Ingres Corp., Sybase, Inc. and Oracle Corp. Nonrelational databases also can handle image retrieval through the use of pointers.

Even though scanned images are easily stored in optical discs and compact disc/read-only memory as well as in magnetic media, handling these multimegabyte images takes time. Users have to allow several seconds for an image to be painted on-screen. Often, transmitting such long files also takes more time than users expect.

> "THE QUALITY OF the [imaging] system won't matter if you have to take a coffee break every time you retrieve an image."
>
> GILBERT WAI
> INFORMIX

"The challenge is to get multimedia working in a networked environment," Wai said. Compression algorithms that shrink multimegabyte files into files of 100K bytes or less already exist, but RDMBS vendors have not offered them as standard features because demand for them has not been high.

When storage problems have been resolved, imaging systems need to "understand" the images, even if the images are stored as BLOBs. "We are working on defining new data types," said Dave Kellogg, DBMS product manager at Ingres. "We've already built an infrastructure that can handle strange objects such as digitized images, but the RDBMS needs to understand the content of what has been stored." Kellogg said he expected such algorithms to be available by the mid-1990s.

Sawyer cited possible new uses that might include automated handling of all driver's license information, including the driver's photograph, so that a system could recognize all drivers who wear glasses; "smart" searching of medical X-rays by RDBMS software to identify those images that show a particular abnormality; and sharing of videoconferencing with images across telephone lines, he said.

Even now, there is the prospect of archiving documents at less cost — and of productivity gains of 50% or more. The Auto Club of Southern California, which began installing IBM's Image Plus system last October, wanted to dig itself out from under stacks of paperwork.

"We have 31,000 sq ft of filing space just to store all the paper," explained C.L. Murray, group manager of IS operations at the auto club. "It takes 60 people just to maintain those files."

However, it shouldn't be surprising that the auto club, which writes $800 million in insurance policies each year, was an early implementer of imaging technology, according to Thornton May, director of imaging research at Nolan Norton. "Users who have too much space allocated to filing cabinets can easily justify the initially high cost of an imaging system, based on traditional return-on-investment expectations," May said. "The breakaway people are going to be those who are trying to use the new imaging technology to create a new platform of competition."

NEW DEALS

Storage Tek wins contract

Storage Technology Corp. recently won a $38 million contract from the Environmental Protection Agency to provide storage systems over the next five years. The deal will include installation of Storage Tek's 8380 disk storage subsystem and solid-state disk.

Health Alliance Plan of Michigan will purchase a Bull H. N. Information Systems, Inc. high-end mainframe, the DPS 9000. The mainframe, which will reportedly bring the health maintenance organization six times its previous processing power, will be used to consolidate development and production work currently being done on three Bull DPS 8000 computers.

The U.S. Navy awarded Harris Corp. a $10 million contract for its Night Hawk real-time computers. The company said its multiprocessing systems will be used in the project for the Navy's newest fighter, the A-12 Advanced Tactical Aircraft.

Sabena Belgian World Airlines recently picked up two Unisys Corp. 2200/400 mainframes and associated peripherals for $3 million. One system will handle a cargo management system while the other will be used for backup and system testing and development. Sabena will be using the Unisys USAS Cargo System application, a real-time freight management system.

Convex Computer Corp. installed a C220 supercomputer at The Mount Sinai Medical Center in New York. The system will be used in computational molecular biology and molecular biophysics projects.

The Open RDBMS What is it? And what are its benefits?

Two weeks from today, Sybase will publish its views on this, the second Sybase Forum topic. We regret that Oracle did not contribute their views to the first Sybase Forum. Once again, we invite them to join us, and offer to publish their comments on the Open RDBMS unedited, and free of charge.

The Sybase View

The Oracle View

(The Sybase invitation to Oracle, delivered by hand, covered the following points in detail. One: manuscripts must be limited to 500 words or less. Two: manuscripts from both parties must be submitted to the San Francisco office of the accounting firm of Ernst & Young by 5 PM, Tuesday, February 27, 1990. Three: Ernst & Young will ensure that manuscripts are published in full, and exactly as submitted. Four: no revisions will be allowed, and neither party will be permitted to see the other's comments prior to submitting its own manuscript.)

THE SYBASE FORUM

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NCR, Teradata launch parallel venture

BY ELLIS BOOKER
CW STAFF

DAYTON, Ohio — The joint venture between NCR Corp. and Teradata Corp. announced earlier this month means an infusion of technological innovation for NCR and needed cash for Teradata, according to analysts.

The companies will work to develop parallel processing technologies for general-business applications. Under terms of the agreement, which is still subject to approval by the boards of both companies, NCR will take a 10% stake in Teradata through the purchase of newly issued stock.

Analysts said NCR could use Teradata's help in technology, while Teradata, a manufacturer of high-performance parallel systems for relational database management, has been outspoken of late about its wish to find a financial partner.

"Teradata has taken parallel processing and applied it in a rather unique way — they pioneered in using it in commercial environments," said Jeff Canin, an independent industry analyst in San Francisco.

The fact that NCR opted to commit to the formation of a new company — rather than simply a technology-sharing relationship with Teradata — indicates that "it is of strategic importance to their high-end database line," Canin said.

NCR pointed out that it has had multiprocessor systems such as the Tower 800 and the NCR 9800 series mainframe for several years. In addition, NCR said it is providing Teradata with expertise in open architecture systems.

John Jones, a senior analyst at Montgomery Securities in San Francisco, noted that NCR's senior vice-president and chief scientist, Philip M. Neches, was one of the co-founders of Teradata. Neches, 37, joined NCR last March. While at Teradata he was the chief architect of the DBC/1012 Data Base Computer System, which is a very large multiple microprocessor parallel computer.

Hamilton

FROM PAGE 27

sound, is that a company can't be too prepared. A company needs at least three components: a solid backup option, sound procedures and a cooperative vendor or vendors. Basis got by on two out of three. For the companies out there reading this, it's probably time to double-check that you have at least two out of three as well.

Basis' problem with the backup facility was the telecommunications lines, according to Bill Kenney, an executive vice-president at the company. Basis provides computer services to banks and other financial services firms. Many Basis customers, such as automated teller machine providers, require a no-fail, 24-hour-a-day service.

In the main data center, Basis has redundant hardware and redundant telecommunications lines to achieve this. There is no such redundant telecommunications facility in the backup data center as yet.

Kenney said Basis is in the process of bringing such a capability to the backup center; it is scheduled for completion in July. Of course, that completion will come six months too late for what happened to Basis.

However, Basis was able to swing back quickly from its disaster anyway. In terms of its disaster recovery procedures, the firm appears to have been well-prepared. Within an hour after the storm hit, management was already assembling at Basis and putting together jobs for disaster team members to handle. Kenney had no war stories of confusion among the ranks. Instead, they each worked on assigned projects, and the team was able to clean up, move, repair and reboot equipment at a very quick pace. In two days' time, Basis went from a water-soaked and virtually useless data center to one that supported its full production environment.

Interestingly, Kenney said that management had held a meeting the day before the storm to review disaster recovery procedures. This had been scheduled long before and was held without knowledge of the approaching storm. Instead, it was a case of good timing. "It was rather fresh to some people Saturday morning when a disaster really did occur," he said.

The second factor in Basis' favor was its relationship with Unisys. Basis claims to be one of Unisys' biggest customers in the area, and the two apparently work well together. When Basis asked Unisys to find two replacement mainframes — no easy feat — the company went all-out to track down two and ship them to Basis in two days, according to Kenney.

"We work with a vendor, and there's an understanding that they'll provide you with equipment when you declare a disaster," Kenney said.

He also said there was no official contract of this nature, but there was an understanding that Unisys would do its best under such circumstances.

Hamilton is Computerworld's senior editor, systems.

Sterling

FROM PAGE 27

Set Services. Running SAMS in conjunction with DFSMS, a user could provide for automatic reallocation of resources or shift files at the click of a mouse. However, users offered mixed opinions on the value of more automated storage management.

The complete SAMS package costs $76,000. Unbundled, DMS/OS costs $31,000; both VAM products cost $18,000; Shrink/MVS costs $15,000; and View and AIM cost $24,000.

Randy Lebedz, senior data processing officer in the North Brunswick, N.J., data center of First Fidelity Bank NA and a user of both DMS/OS and VAM, said that SAMS will allow him to set up a rule that would dictate, for example, that if a production volume becomes more than 80% to 85% full, SAMS would automatically migrate data to a volume pool that has 50% free.

"AIM will save manpower, but it will also resolve potential problems before they occur," Lebedz said.

View will offer a picture of several storage pools, Lebedz said, as well as each pool's utilization. "We can release space right on the View screen by using a mouse to point toward the volume in the pool," he said. "Right now, if there is a problem someone will identify a solution and we will have to set up a batch job, have it go out and record how much space we have."

First Fidelity, which runs IBM's ESA does not run DFSMS because of overhead and its requirements for organizing and cataloging of data sets, Lebedz said. "In the real world, a lot of data — such as unmovable data and mass storage systems — fall outside of the scope of DFSMS," he said. "With SAMS you don't need DFSMS."

In contrast, John Brightly, technical services manager at American Tobacco Co. in Chester, Va., which runs IBM's MVS, was cautious about the announcement. "We are probably one of the more progressive users of Sterling's two VAM products and DMS/OS and have gotten tremendous payback, but I don't see a lot of benefit to the bridges," he said.

Brightly said that the AIM interface is used by Sterling for its own functions, and he anticipates a future release that will permit programs to request storage management functions.

He said he also worries that the automated storage functions will disrupt the high-activity data sets that firms place in specific locations for optimum response.

However, according to Charles Keiper, senior technical consultant at Sterling, users would have the capability to exempt certain classes or a whole volume of data sets.

Unisys revamps Scamp chip, beefs up low-end systems

BY JEAN S. BOZMAN
CW STAFF

BLUE BELL, Pa. — Unisys Corp. last week enhanced its Scamp chip — the basis of the year-old Micro-A computer line — to create an upgrade path for low-end A series machines and for aging Burroughs Corp. computers.

The new machines moving to the Scamp architecture are the A4 series and A6 series "S" models, with the "S" designating use of the Scamp chip. Memory on the S models has been doubled to 96M bytes per processor, and processing power is being increased by 50%. Meanwhile, Unisys is discontinuing the A1, A4 and A6 "X" models.

"They are about six months ahead of schedule," said George Lindamood, program director of Gartner Group, Inc.'s Industry Service. "They introduced the A3 in September 1984 and added the A4 and A6 in September 1987. I would have expected an announcement later this fall."

The revamped low-end computer line allows users of small-scale computers to get the benefits of multiprocessing enjoyed by high-end A series users, Lindamood said.

The A6 NS model has four processors in two cabinets and features a new partitioning option that will allow users to divide batch and on-line applications and to reconfigure the processors as needed. The partitioning software, scheduled for availability this spring, is designed to protect production work from interference by programs under development.

The new computers can be configured with one or two processors in each cabinet. The A6 models, ranging in price from $150,000 to $500,000, are available for shipment now — with the exception of the A6 NS, scheduled for shipment in April.

One Burroughs/Unisys user said he is more interested in the upgrade potential for older systems, including the B 1900 series, which run the same software and operating system as the A series. "We try to budget for a system that will last us five years," said Craig Burlingame, director of data processing for the town of Barnstable, Mass., which has been field-testing the A6 since September.

NEW PRODUCTS — SOFTWARE

Database management systems

An on-line query tool that allows users to submit SQL queries to IBM's DB2 from CICS has been announced by Cone Software Laboratory, Inc.

Called Kicks/SQL, the product uses the DB2 dynamic SQL function to submit any Select statement to the database. This gives CICS users immediate on-line access to DB2 directly from CICS, according to the company. The software costs $8,000.

Cone Software
600 Upland Ave.
Upland, Pa. 19015
800-548-5660

Applications packages

SBT Corp. has released Version 6.3 of its SBT Payroll program for multiuser and single-user environments.

The software was designed to maintain payroll and labor information for all types of employees and to generate quarterly and annual returns for local, state and federal governments. Version 6.3 offers the Employee Wage and Tax Report, which includes taxes for all categories as well as gross wages, net income, tips, total hours and cafeteria plan deferred compensation. It runs on Unix, Digital Equipment Corp. VMS, MS-DOS and Apple Computer, Inc. Macintosh platforms and is priced from $295.

SBT
1 Harbor Drive
Sausalito, Calif. 94965
415-331-9900

Ross Systems, Inc. has announced a billing management and analysis software system for use with Digital Equipment Corp. VAX computers.

The Distribution/Billing package provides customer information such as contract pricing, discounts and special instructions and accommodates extensions as well as pricing, freight and tax information. It is tier-priced by CPU from $9,500, according to the company.

Ross Systems
1860 Embarcadero Road
Palo Alto, Calif. 94303
415-856-1100

MICRO BITS

Douglas Barney

Sun's great challenge

A little more than a year ago, Sun Microsystems was the talk of the town. Its workstations put pressure on everyone else in sight to cut prices and up power. Co-founder Bill Joy was annointed as a guru, and young Chief Executive Officer Scott McNealy was toasted on the pages of nearly every business journal.

Then two rotten things happened. First, Steve Jobs showed up with his Next machine. The media lords that had worshipped Sun shifted back to Jobs, even though he had yet to ship anything and his product "line" consisted of one computer.

Even worse, although it was due more to an accounting snafu than business problems, Sun lost money. In this business, losing money is about the worst sin a company can commit.

The trick for Sun now is to make a recovery. It must simultaneously reclaim the throne of innovation and overcome the bad karma of financial problems that killed Cullinet, whammed Wang and battered Ashton-Tate. Sun has to become an exciting company again. It has to

Continued on page 38

Apple still struggling to scale CAD mountain

ANALYSIS

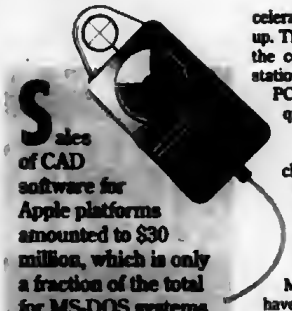
BY JAMES DALY
CW STAFF

What's wrong with this picture? Take an easy-to-use personal computer famous for high-quality graphics and pitch it at a computer-aided design (CAD) market that is chock-full of engineers thirsting for better ways to monkey around with on-screen design prototypes.

Give up? Join the crowd. Despite long-term efforts, executives at Apple Computer, Inc. are still struggling to plant the flag of the Macintosh II atop a market that once seemed a natural conquest.

Although Dataquest, Inc. ranks Apple a respectable third behind Compaq Computer Corp. and IBM in the overall CAD market, the scenario could have been much different if it had not been for a crucial marketing misstep.

A year ago, it all seemed so simple. For too long, Apple executives believed, they had played second fiddle to MS-DOS and Unix-based systems in the engineering workstation market. The Macintosh II was supposed to be the great equalizer and accelerate Apple's game of catch-up. The basics were all covered: the consistent interface, workstation performance and near-PC prices. The CAD field quickly became a chief vertical market thrust.



Sales of CAD software for Apple platforms amounted to $30 million, which is only a fraction of the total for MS-DOS systems estimated at $250-$300 million in 1989

Source: Dataquest

Trouble is, a great machine is but a great paperweight without the appropriate software. Apple furiously encouraged software development and, within the past year, Mac-based CAD packages have arrived from such CAD software stalwarts as Versacad Corp., Autodesk, Inc. and Schlumberger Technologies.

"We were going after more of the casual user than the heads-down user — the person who spends only about 30% of their

Continued on page 38

Networked Freelance Plus unveiled

BY PATRICIA KEEFE
CW STAFF

CAMBRIDGE, Mass. — Lotus Development Corp. recently extended its family of networkable applications by announcing a networked version of Freelance Plus, Version 3.01.

Lotus already offers networked versions of its 1-2-3, Symphony and Manuscript.

David Cearly, a software analyst at Gartner Group, Inc., is cautious about Lotus' network strategy. He claimed Lotus offers a minimal level of networking support. For example, Cearly suggested, as long as it runs on the server without crashing and does appropriate file-locking, then it is networked. "It's good to have, but these capabilities [do not represent] a great stride forward in technology by any stretch of the imagination," he said.

What Lotus does offer in terms of network capabilities are the following:

- File-sharing, designed to prevent unintended file modification in a multiuser environment.
- Support for the Lotus 1-2-3 file reservation scheme, said to spare users from unknowingly changing 1-2-3 data while viewing or importing shared spreadsheet files.
- Local-area network administration tools, which enable users to install, control and manage all Lotus products on the LAN from one menu screen.

Other features include the ability to conserve hard disk space on individual personal computers attached to the LAN, access to shared peripheral devices and storage of symbol libraries or clip art on the network for shared use.

The network-compatible version of Freelance Plus, Lotus' graphics software, is slated for second-quarter shipment and will be available in three versions — standard, server and node. Standard Edition shipped in September and is intended for a single user in either a stand-alone or networked environment.

The Server Edition package costs $695, and includes a central file server, one-user-license software, network administration tools and appropriate documentation.

Priced at $395, the Node Edition consists of a single license for network use, documentation and a user guide.

All three versions require a minimum of 438K bytes available after DOS and the network software are loaded. The network editions are certified for use with DOS 3.1-compatible network operating systems, including IBM's PC LAN Program 1.2 and 1.3, 3Com Corp.'s 3+Share 1.3, Novell, Inc.'s SFT Netware 2.15 and Banyan Systems, Inc.'s Vines 3.0.

Inside

- Aiming for the future at Merrill Lynch. Page 37.
- Microsoft moves into mainframe servers. Page 37.
- Kodak announces portable printer for Macintosh. Page 40.

Presentation Manager Arrives For Micro Focus COBOL/2 Programmers!

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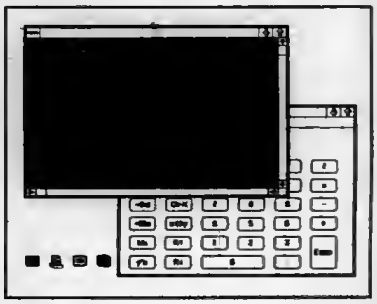

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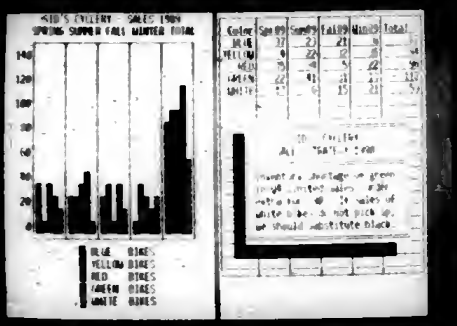

Introducing the Wyse WY-370 General-Purpose Color Terminal.

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Merrill Lynch's Moeller steers toward future

ON SITE

BY CHARLES VON SIMSON
CW STAFF

NEW YORK — If you are comforted by people saying that SQL front ends and graphical interfaces are just hyped-up technologies of limited value for the next few years, you don't want to meet Danny Moeller.

Moeller is a Merrill Lynch & Co. assistant vice-president in charge of weaning 250 investment bankers and their secretaries from green-screened ASCII IBM Personal Computer ATs and clones with Irma boards and onto whatever the platform of the future proves to be.

Moving onto the platform of the future entails two primary thrusts. The entire corporation is moving disparate mainframe databases into IBM's DB2. At the same time, the investment banking division is migrating to Microsoft Corp.'s Windows for applications integration and interface, and Gupta Technology, Inc.'s SQL Network connection into DB2 databases.

In with the new

Moeller's effort to move users in his group to new technology is typical of what is going on at Merrill Lynch, where the new standards are DB2, Windows and Microsoft applications.

In fact, Moeller said, it has not taken much weaning to make users move. "When technology works right, people don't have to be told to use it," he said.

Merrill Lynch's investment banking group, located in the World Trade Center, currently runs on a Banyan Systems, Inc. local-area network with standard personal computer applications. The systems are connected via individual Digital Communications Associates, Inc. Irma boards into a corporate mainframe where they have access to Software AG Adabase and Computer Associates, Inc. IDMS database information on clients and other corporations. The information is in the form of both text background and numerical financial data.

Today, bankers must exit applications they are using, log into the mainframe and access information in the two database formats. They then capture the data and re-enter it into reports in the original application. Under Windows and SQL Network, users will be able to open multiple data windows and cut and paste data between environments.

"If you forget about productivity, the data integrity issues involved in that are huge," Moeller said. "We have corporate databases and reports where it translates into things being spelled several different ways. It makes managing the database much more difficult."

However, Moeller's challenge is not to simply slap an interface on the data. The company standardized on the DB2 relational database format. It is up to Moeller to port the current information to the mainframe DB2. To do that, he is using Gupta's SQL Base development language to reformat the data.

"It is a very powerful system," he said. "While we have had some minor discrepancies between SQL Base and DB2, it hasn't slowed down the development process."

Joyce Bond

Moeller *is pushing Merrill Lynch in a graphical direction*

With the migration of that data nearly completed, Moeller and his staff are working on adding the Windows front end to Gupta's SQL Network connection to DB2. The company is actively evaluating the anticipated release of Windows 3.0.

The most obvious reason is that the system's intuitive graphical interface allows for greatly increased ease of use. In addition, however, the ability to have multiple screens open simultaneously lets bankers keep a report on-screen while they access supporting DB2 information via Gupta's SQL Network.

In a typical application, bankers can switch among windows to generate reports that incorporate textual background information and revenue figures drawn from DB2 via SQL Network. With the older technology, users must log off from one application, log into another and capture information before bringing it back to be merged into the original application.

"You give up some speed from a direct Irma board connection," Moeller said, "but we have found that the ability to concentrate on a problem while accessing necessary data is a large boost to the bankers' productivity."

In addition, the Windows/Gupta combination has also increased the flexibility and maintenance of security. Buttons and pads on Windows can be grayed out remotely for groups that do not have access to certain features, making the security-access limitations obvious to users. Third-party products automate the function.

The migration of both mainframe data to DB2 and bankers' platforms to Windows has gone smoothly and is likely to be completed by this summer. However, there are some issues that Moeller is still wrestling with. The optimal size of the bankers' platform may have to grow by as much as one to four megabytes depending on the memory requirements of Windows 3.0 and the sophistication of the applications, such as Microsoft's Excel spreadsheet, that the users are running.

Moreover, the process of converting to DB2 was not without early problems. The project started in March 1988, a time frame for development that Moeller said has been somewhat long. "There is a significant learning curve," he said, "but we have hit the top and should see much faster times for future projects."

Microsoft eyes mainframe access

Joint venture with Micro Decisionware will link up SQL Server, DB2

BY PATRICIA KEEFE
CW STAFF

REDMOND, Wash. — An ambitious Microsoft Corp. is growing up and spreading out. A week after announcing plans to co-opt the mainframe as a LAN Manager server, Microsoft last week unwrapped an alliance designed to link its desktop SQL Server to IBM's host-based DB2 database.

"This clarifies what direction Microsoft is heading into with its Network Business Unit. Before, it looked like they were just going after the LAN. Now they are clearly looking at mainframe access," said Nancy McSharry, an analyst at International Data Corp., a market research firm based in Framingham, Mass.

"DB2 is a major force. It has 70% of the licenses for relational database systems up in the MVS world. As such, connectivity to DB2 has to be a critical component of any [SQL] server strategy," said David Cearley, a software analyst at Gartner Group, Inc. in Stamford, Conn.

To provide that component, Microsoft has teamed with Boulder, Colo.-based Micro Decisionware, a gateway developer that claims a customer base of 140 installations, at least 80 of which use DB2.

The jointly developed Database Gateway will enable users to integrate local-area network-based work groups into corporate information systems, said Richard Hackathon, Micro Decisionware's founder and vice-president of technology.

"The design and development of corporatewide cooperative applications built upon Microsoft's systems products has to be seriously considered today by every MIS manager," he said.

The Database Gateway is said to be an "advanced" OS/2 server-based software link that provides both standard personal computer applications and custom-developed SQL Server programs with access to DB2 under MVS/CICS.

Users have two options. They can access DB2 data directly through any SQL front end without going through the SQL Server, or they can move data in the DB2 database onto an SQL Server for LAN access.

Either way, they will be shielded from having to know anything about SQL or data access methods. The same set of commands will link the user to any server, but they do have to know what data is on which server, said David Kaplan, Microsoft's director of ISV relations and former SQL Server product manager.

Users will have a choice of front ends because the gateway's programming interface is the same as SQL Server's. Developers will also be able to distribute their front-end applications across multiple platforms via one application programming interface, the SQL Server DB-Library, according to Jim Harding, vice-president at Revelation Technologies.

The gateway is now in limited beta testing and is slated for general availability in June. Single unit pricing is set at $2,295. A developer's kit priced at $6,895 will be available in late April.

Microsoft's DB2 gateway trails the competition, at least in timing, according to Cearley, who said that "other people have had it first."

For example, Gupta Technologies, Inc. already provides its database users with access to DB2. Gupta's SQLwindows serves as a front end to its LAN-based SQLbase Server, as well as the host-based DB2. SQLbase Version 4.0 includes enhanced connections to DB2. Gupta links to DB2 via a gateway and has said it will build similar gateways to Oracle Corp.'s database and to IBM's Extended Edition.

The Microsoft/Digital Communications Associates, Inc. Communications Workstation is required to connect with IBM mainframes using Advanced Program-to-Program Communications.

The Microsoft/DCA Communications Server or IBM's Extended Edition Communications Manager can also be used to connect the desktop to the host.

Mitsubishi to test card

TOKYO — Mitsubishi Electronic Corp. will begin testing a new 2M-byte static random-access memory (RAM) card at the end of March. The card is targeted as a storage device for operating systems and applications for notebook computers.

Mitsubishi claimed it will be the first company to offer a general-purpose static RAM card with memory capacity exceeding that of a standard-memory 3½-in. floppy disk.

Static RAMs are memory chips that require power in order to hold their content. Unlike dynamic random-access memory (DRAM) chips, they do not require continuous regeneration of the content.

The card is 3.4mm thick, compared with floppy disks, which range from 17mm to 20mm. The card is made up of 16 1M-bit static RAM chips.

The sample price is set at approximately $2,000. Monthly production rates will start at 20,000 units.

MICRO BITS

PRC to use Informix to build MLS products

PRC Realty Systems, Inc., a supplier of computer-based information systems to the real estate industry, said it will use **Informix Software, Inc.**'s line of SQL-based development tools to build planned Unix-based multiple listing service system products. PRC will use the Informix-4GL development environment and the Online database engine, which is said to combine fault-tolerant on-line transaction-processing performance with multimedia capabilities.

Alias Research, Inc., a supplier of three-dimensional graphics for industrial design, has donated nearly $800,000 in software to the Pasadena, Calif.-based Art Center College of Design. The gift consists of eight workstations equipped with Alisa/2 software and includes an agreement to maintain and upgrade the school's software programs.

Arkenstone, a nonprofit developer and marketer of low-cost modular reading machines, will provide 100 Hewlett-Packard Co. Scanjet scanners at no charge to the visually impaired. The donation reduces the cost of Arkenstone's reading machine from $3,250 to $2,250. Donations and special deals from the for-profit sector help Arkenstone, incorporated as a charity, keep pricing for its readers low.

Sun Microsystems, Inc. has donated a Scalable Processor Architecture-based Sun 4/280 server to the nonprofit **European Unix Systems User Group**. Dubbed "mcsun," the server will operate as the backbone computer for the group's European Unix Network.

Sun has also signed a licensing agreement with UK-based **Combined Higher Education Software Team**, designating Sun's Network File System for personal computers (PC-NFS) as the PC networking standard for higher educational institutions throughout England. Approximately 100,000 PCs are expected to use PC-NFS at 80 to 100 campuses.

System to support CD-ROM applications

BY SALLY CUSACK
CW STAFF

Companies toying with creating in-house compact disc/read-only memory (CD-ROM) applications may be able to turn wishes into reality using a CD-ROM development system recently unveiled by Reference Technology, Inc. in Boulder, Colo.

Scheduled to ship in March, the Referenceset modular system is targeted at a variety of CD-ROM application developers, such as publishers, government agencies and corporations.

The product is comprised of three main components: the Referencebench data preparation workbench for capturing, converting and indexing data to be placed on CD-ROM discs; the CD-Simulator system for optimizing and debugging CD-ROM applications; and the Referencebook retrieval software for accessing CD-ROM data.

The CD-Simulator system attaches to an Intel Corp. 80286- or 80386-based machine and is available in three configurations. The Primary System offers a nine-track magnetic tape drive in a stand-alone cabinet; the Desktop System has a tabletop nine-track magnetic tape; and the Compact System includes a 9mm cartridge tape drive. All versions include a minimum 600M bytes of magnetic disk.

Pricing for the CD-Simulator begins at $19,000 for a turnkey hardware and software system. The Referenceset tools are priced from $12,000, and Referencebook retrieval software can be licensed from $15 per replica.

Barney

FROM PAGE 35

get aggressive and nasty.

Fortunately for Sun, it is in a hot market. According to Dataquest, worldwide workstation sales jumped some 40% in 1989 to $6.1 billion, and Sun leads the pack. That heat has helped Sun cast aside many of its financial problems. Revenue for the second quarter hit $595.4 million, up almost $150 million from the previous quarter's $448.2 million.

But can Sun crack the commercial markets, which are clearly dominated by comparatively pathetic machines from IBM, IBM cloners and Apple? With such pals as Lotus and Ashton-Tate, Sun has a real shot.

One favorable sign is the sheer elegance of the Lotus product for Sun. Even better is the $695 price tag, which is close to that of most other Lotus products. This is quite a bit better than the 300% to 400% premium that most workstation software products have commanded. A couple thousand more programs like this, and Sun will really roll.

Despite these positive signs, Sun must overcome the shadow of Next and the hellbent-for-leather attitudes of its workstation competitors and must keep from getting killed by its open systems strategy, a semi-open approach to computing.

Part of its strategy involves the Scalable Processor Architecture, or Sparc, a reduced instruction set architecture that Sun wants everyone to use. Although Sparc now dominates over Sun's Motorola-based products and never-quite-successful Intel-based offerings, it has only been adopted by a small number of second-rate players. None of those firms pack the punch of an IBM, DEC or Hewlett-Packard — all companies allied in some way against Sun.

Fortunately for Sun, time and technology seem to be on its side. Its Open Look interface is beating the Open Software Foundation's OSF/Motif to market by a substantial margin, and AT&T and Sun are now beginning to devise a system that will allow OSF applications to run under Open Look, which may be ported to other mainstream architectures.

The battle between OSF and Open Look will be savage. Logic seems to side with Open Look. This environment, along with AT&T Unix System Version 4.0, was fairly well-defined before OSF even formed. It must have been pretty scary technology to get Ken Olsen and John Akers on the same dais. These guys aren't kissing cousins unless they absolutely have to be.

When the OSF declared war on Sun and AT&T, it had virtually no artillery. In fact, it took up an utterly inane position. The message was, "We don't like your standard, so we are going to come up with a different one. We just don't know what yet."

The fact that Sun's competitors took such a comical stance likely did little to soothe the nerves of Sun's young executives. After all, it was IBM, DEC and HP that mutually agreed on such ridiculousness.

It is going to be a hell of a battle. Users are likely to watch the big boys hurl each other around and go with whomever is left standing. It just might be Sun — if it can repair an image battered by Steven P. Jobs.

Barney is editor in chief of Amiga World.

Behavior Tech offers PC

BY RICHARD PASTORE
CW STAFF

Another firm has unveiled a personal computer based on Intel Corp.'s 1486 microprocessor — this time, 4-year-old Fremont, Calif.-based Behavior Tech Computer Corp. USA.

Behavior's Starflex 4025 operates at 25 MHz and "was designed to take advantage of all available operating systems," said Mei Hsu, vice-president of sales. Operating systems specifically cited include DOS, OS/2, Unix, Xenix and Microsoft Corp.'s Windows 386.

The system features 64K bytes of memory cache and 32-bit system memory expandable from 1M byte to 16M bytes. The PC also has a second-level cache option and offers Weitek 4167 coprocessor support with an adapter board. The motherboard is equipped with BIOS from Phoenix Technologies Ltd.

The unit ships with a 1.2M-byte floppy disk drive and is available in either a desktop or tower configuration.

Pricing for the system begins at $5,260. The machine is scheduled to begin shipping in the second quarter.

Apple

FROM PAGE 35

time doing design work," said Dave Kulbarsh, Apple's director of CAD marketing.

Another funny thing happened on the way to the cash register. "Apple thought that if its dealers could sell desktop publishing software, CAD would be no problem. Well, CAD was a problem," said Bruce Jenkins, an analyst at the Daratech, Inc. research firm in Cambridge, Mass.

The result was that sales, particularly of sophisticated high-end packages, were stumbling. Dealers who had flourished selling simple low-end packages to the home and small-business market found themselves stammering when making their CAD pitch. "We found that most of the dealers could talk a good game but weren't willing to make the extra effort to make the packages a success," said Michael Smith, director of channels marketing at Schlumberger.

Quick response

In response, Apple marketeers quickly instituted a program that educates Mac dealerships in the ways of selling CAD packages and another program that allows traditional CAD value-added resellers to qualify as Apple dealers without the high hardware sales volume requirements that Apple imposes on regular dealers.

The programs have helped, Smith said, but precious time was lost. Smith said Schlumberger's Macbravo package was introduced in June, but significant sales did not begin until nearly October. Overall, Mac CAD software packages last year totaled only $30 million in sales, about one-tenth that of similar MS-DOS packages, Daratech reported.

Also hindering Apple was the lack of a machine that could compete with the computational muscle of Intel Corp. 80286 and 80386-based systems. "The big knock against the Mac has always been performance," said Andrew Zarrillo, a spokesman for Autodesk. Zarrillo said that less than 10% of Autodesk's sales are to Mac shops.

Apple hopes to bury those complaints with its high-end Mac IICI, currently out, and the Mac IIXI, which is scheduled to be introduced next month. Both are expected to compete with Sun Microsystems, Inc. workstations in price and performance.

There have been other complaints about the guts of the machine, as well. "We still won't consider the Mac a viable CAD solution until it comes with a graphics coprocessor," said Mike Bailey, a systems integrator at Lockheed Missiles & Space Corp. in Cupertino, Calif., reiterating a belief expressed nearly a year ago [CW, April 11, 1989].

Apple officials have hinted that this option may arrive with the Mac IIXI. "It'll be a solid contender one day because of its interface, but not until that graphics coproccessor comes along," Bailey added.

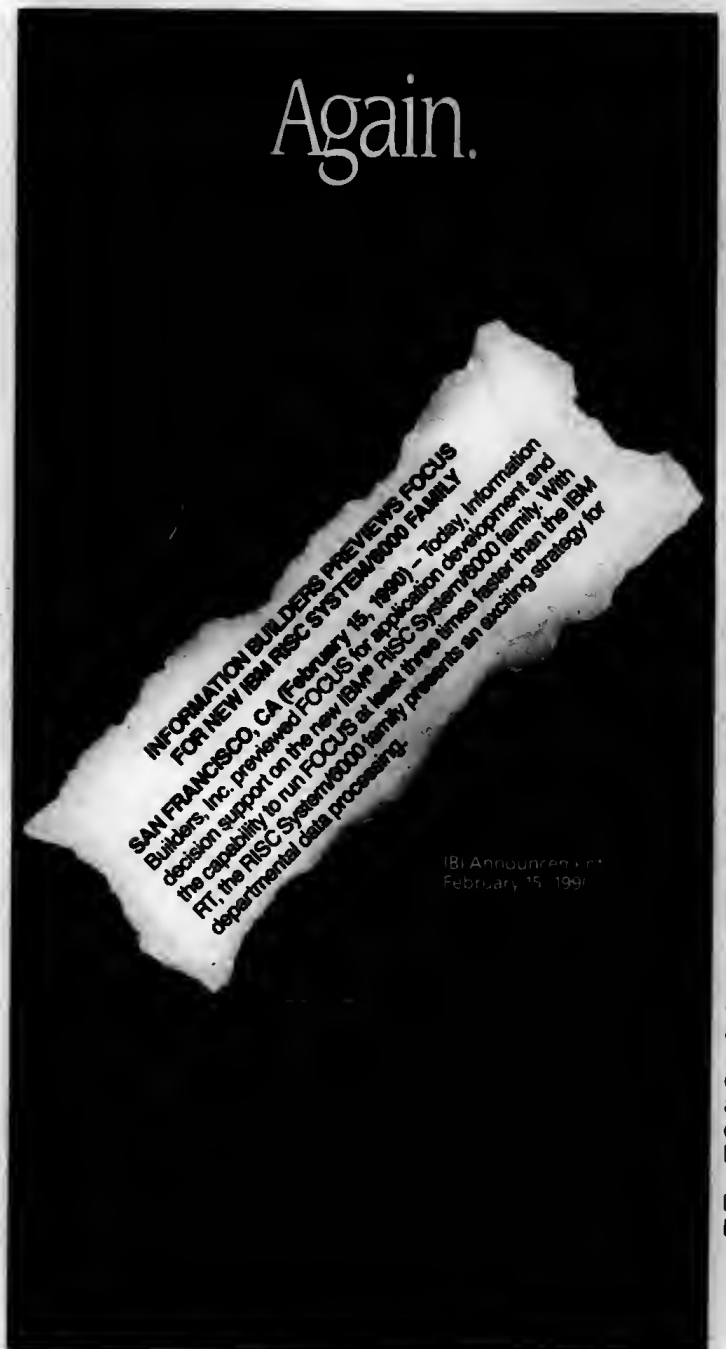
Other problems

The lack of a multitasking operating system has also hurt Apple, and the company is no longer the only kid in town with an easy-to-use graphical user interface, once one of the Mac's most sellable features. The easily manipulated graphics that once gave Apple an early lead are now eroding, courtesy of IBM's Presentation Manager and Microsoft Corp.'s Windows.

Despite these stumbling blocks, Apple officials said they are confident that the Mac will have its day in the CAD sun. And the cutting up of the CAD market is still far from a done deal.

"As yet, nobody owns the market," said Kathy Hale, an analyst at Dataquest, Inc. "[Apple's] high-end has stumbled, but the low-end is holding its own. And there is still plenty of playing time left in the CAD game."

February 15, 1990
IBM introduces RISC SYSTEM/6000
FOCUS 4GL was there.



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NEW PRODUCTS

Systems

A personal computer-based, turnkey factory management/control system is available from Factory Automation and Computer Technologies, Inc. for make-to-order manufacturing environments. The Factory System executes manufacturing tasks and manages shop-floor resources.

The system allows customers to expand from a single unit to 255 nodes in any combination of off-the-shelf IBM-compatible PCs and can use clusters of PCs to deliver mainframe performance.

It is priced by computer type, ranging from $1,875 per node for an Intel Corp. 8086-based system to $7,500 per node for an 80386-based system. The multiprocessing platform costs $25,000.

Factory Automation
3 Cornell Road
Latham, N.Y. 12110
518-786-3900

Software applications packages

Automation software for sales and marketing departments from Hi-Tek Computer Products Corp. reportedly allows users to analyze staff performance and activities, track sales leads and analyze competing companies' strengths and weaknesses.

The menu-driven S.P.M. is customized for vertical markets, such as computer resellers, and insurance, banking and financial services. S.P.M. runs on MS-DOS, Xenix, Unix and various local-area network operating systems.

Hi-Tek Computer Products
308 W. Erie St.
Chicago, Ill. 60610
312-787-2000

Software utilities

A free utility designed to provide basic computer information to personal computer users has been announced by Lotus Development Corp. Called Chk1-2-3, the software assists Lotus users in choosing the 1-2-3 spreadsheet that best suits their application needs and hardware configuration. The utility locates and reports on the system and memory configuration of IBM Personal Computer ATs, Personal System/2s, Compaq Computer Corp. machines and compatible systems. The program is not copy-protected.

Lotus
55 Cambridge Pkwy.
Cambridge, Mass. 02142
617-577-8500

Peripherals

Eastman Kodak Co. has unveiled the Diconix M150, a version of its portable printer created specifically for use with Apple Computer, Inc.'s family of Macintosh computers.

According to the company, the ink-jet printer weighs 3.1 pounds and was designed as a traveling companion for the recently announced Macintosh portable machine. It also works with the Macintosh SE, SE/30, Plus and II series. The device uses standard C-size rechargeable batteries and offers 192 by 192 dot/in. resolution.

The Diconix M150 costs $699.

Eastman Kodak
901 Elmgrove Road
Rochester, N.Y. 14653
716-253-0053

Output Technology's *Lasermatrix 1000 has a 16 page/min. output rate*

A 16 page/min. desktop laser printer is now available from Output Technology Corp.

The Lasermatrix 1000 features a 1000 line/min. output rate and is especially suitable for label, bar-code and graphic printing applications. The unit also includes a scalable font capable of printing in any point size.

The printer is priced at $7,995.

OTC
E. 9922 Montgomery
Spokane, Wash. 99206
509-926-3855

Two 14-in., high-resolution color monitors are now available from Tatung Company of America, Inc.

The models offer a 1024- by 768-pixel interlaced resolution and are aimed at computer-aided design and computer-aided manufacturing, word processing and professional or business graphics applications. The CM-1498X provides a 0.28mm dot pitch and is priced at $799. The CM-1496X has a 0.31mm dot pitch and costs $749. Both are compatible with IBM Video Graphics Array and super Video Graphics Array standards, as well as with IBM 8514/As and compatibles.

Tatung
2850 El Presidio St.
Long Beach, Calif. 90810
213-637-2105

Board-level devices

Aurora Technologies, Inc. has announced four multiport boards designed to plug into the Sbus of the Sun Microsystems, Inc. Sparcstation.

The products — multiport Models 10S, 210S, 400S and 800S — enable Sun's OEMs, value-added resellers and end users to add industry-standard communications lines to the Sparcstation 1, the vendor said.

The Model 10S provides the Sparcstation with a parallel port, thereby allowing parallel printers and plotters to be added to the workstation. The board also provides bidirectional functionality. It sells for $395.

With the Model 210S, Autocad VARs and end users can extend their Sparcstation applications by connecting peripherals such as digitizers, modems, printers and plotters to the workstation. The price is $595.

Models 400S and 800S offer multiuser applications, including accounting, word processing and commercial aplications. Both of these models are scheduled to be available in late March.

The 400S will have a list price of $995; the 800S will sell for $1,695.

Aurora Technologies, Inc.
Suite 2200
One Kendall Square
Cambridge, Mass. 02139
617-577-1288

Invisible Software, Inc. has announced an 8M-byte expanded memory board for IBM Personal Computer XTs, ATs, 386s and compatibles. Called Invisible EMS, the board reportedly provides hardware support for Lotus/Intel/Microsoft Expanded Memory Specification (LIM EMS) Version 4.0 and supports application programs for LIM EMS, including Lotus Development Corp.'s 1-2-3 Version 3.0 and Microsoft Corp.'s Windows.

The board, which supports multitasking, will increase memory up to 640K bytes if there is less than 640K bytes of random-access memory on the computer's motherboard. A "front-fill" feature will increase DOS memory from 640K to 704K bytes on s monochrome system or up to 736K bytes on a color system. The price is $299.

Invisible Software
1165 Chess Drive, Suite D
Foster City, Calif. 94404
415-570-5967

Price reductions on four video boards from Boca Research, Inc. reportedly went into effect Jan. 1, 1990, yielding discounts of up to 43%.

VGA By Boca, a high-end, 16-bit board that offers 640- by 480-pixel resolution, dropped in price from $345 to $195. The 800-by-600 SuperVGA By Boca is now retailing for $245, down from $395. Both high-end products are designed for IBM Personal Computer XTs, ATs, Personal System/2 Models 25s and 30s and compatibles.

EGA By Boca, offering 640- by 350-pixel resolution, now retails for $175, reportedly down 30%, and the 640- by 480-pixel MultiEGA By Boca has dropped in price 35% to $195, according to the vendor. The EGA boards are compatible with IBM PCs, XTs and ATs.

Boca Research
6401 Congress Ave.
Boca Raton, Fla. 33487
407-997-6227

A word processing enhancement board, Splitword J-16 VGA from General Business Machines Corp., adds features such as Split Screen View and Zoom View as screen overlays to such programs as Wordperfect Corp.'s Wordperfect, Ashton-Tate Corp.'s Framework, Microsoft Corp.'s Windows and Wordstar International's Wordstar.

The split-screen feature enables the screen to have two or three additional split screens containing the normal text plus text of choice obtained from another application or a custom message. Zoom View allows single-keystroke screen magnification of two or three times normal size. The standard board costs $345.

General Business Machines
5819 Uplander Way
Culver City, Calif. 90230
213-216-0055

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No matter what language your mainframe speaks in terms of speed, modem standards, or protocols for synchronous or asynchronous communications, chances are excellent there's a SyncLink Combo Modem that's perfect for your application. SyncLink Combo Modems install conveniently inside your PC and require no serial ports, sync adapter boards, external boxes or RS232 cable mess.

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To find out more about SyncLink Combo Modems for industry-standard PCs and PS/2s®, call or write to MicroGate Corporation, 9201 Capital of Texas Highway, Austin, Texas 78759.

For more information call toll-free
1-800-444-1982
In Texas or outside the USA call 512-345-7791

MICROGATE CORPORATION

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When Texas Instruments decided to offer their latest portable solutions, they focused on two things users really wanted in 286-class laptop computers.

Light.

TI introduces the TravelMate™ LT
Full-function AT-compatibility, featuring two of th

Model 12: All the power — half the weight.

Weighing a remarkable 6.7 lbs. — including battery and 20 MB hard disk drive — TI's TravelMate LT286 Model 12 delivers all the processing power of a desktop PC in a laptop. It's the perfect choice for professionals who need to work on-the-go.

Getting started couldn't be easier. That's because the Model 12 has MS-DOS 3.3® and LAPLINK™ in ROM. It also comes with a preformatted disk drive, making it ready to use right out of the box.

With the Model 12, you don't sacrifice performance for small size and weight. Business software runs fast, thanks to a 12 MHz 80286 microprocessor. There's plenty of storage for all kinds of software applications — the internal hard disk drive comes standard. Plus, you get 1 MB of RAM, expandable to 4 MB.

Not only does the Model 12 perform like a desktop PC, it has the same touch. The AT-style keyboard provides full-size, full-travel keys that give your fingers plenty of room.

Other features include an easy-to-read, enhanced Supertwist backlit LCD screen. A removable 3.5" high-density diskette drive provides additional flexibility and convenience — snap it on for loading software or remove it and travel light. And, sending critical work to your office takes only a phone call with an internal modem.

The TravelMate LT286 Model 12: the laptop that doesn't compromise performance for size.

The removable 3.5" high-density diskette drive and internal modem are optional

Bright.

T286 Series of laptop computers.
e industry's lightest, brightest portable solutions.

Models 25 and 45: Dazzling display for windowing and graphics.

If you want portability and an exceptional display for graphics, you'll appreciate the bright side of this solution. TravelMate LT286 Models 25 and 45 feature a brilliant black-on-white VGA display that rivals that of most desktop PCs.

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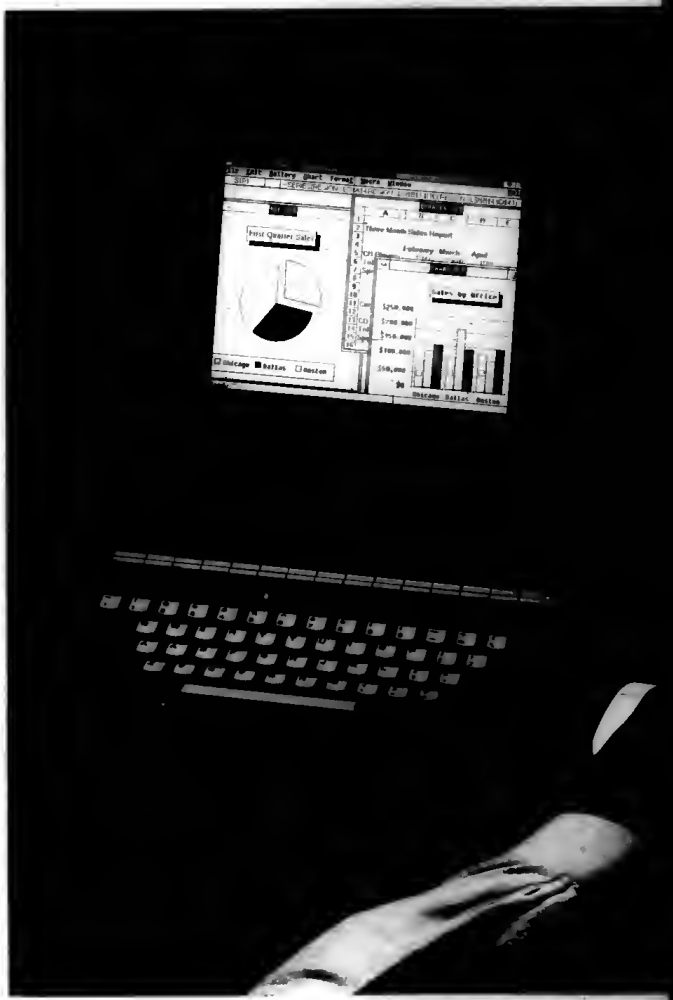
Not only do you get a superb display, you get superb performance as well. Like standard AT-compatible desktop PCs, Models 25 and 45 operate with a 12 MHz 80286 microprocessor for quick and powerful processing. You also get a 20 MB or 40 MB internal hard disk drive; an internal 3.5" diskette drive; 640K of RAM, expandable to 3.64 MB; an AT-style keyboard with full-size, full-travel keys; and an internal battery.

In addition, an intelligent power management system turns off the screen and fixed disk drive during periods of inactivity to extend battery life, allowing you to use the laptop longer.

Considering all these features and the performance and versatility they deliver, why would you ever need a desktop PC?

For computing on-the-desk or on-the-go, it's TravelMate LT286 Models 25 and 45: the 286-class laptops that combine might with bright.



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DTBR005

DATA STREAM

Steven J. Jackowski

IBM's 9370: Deceptive?

Whether it was fear of another "VAX-killer" or internal politics, IBM's newest 9370s came forth quietly in what was perhaps the most low-key announcement of a major product seen in many years. Don't be fooled into thinking of this product as just another midrange system; there is much more under the covers. Mainframe connectivity vendors: Beware!

The 9370 Model 14 is a rather strange-looking device. About the size of a two-drawer filing cabinet, it is composed of a 370 processor, at least one Intel 80386 processor and an IBM Micro Channel Architecture (MCA) bus. If you split the 9370 down the middle, on one side you would have a 370 with an integrated 80386 MCA I/O controller and on the other a Personal System/2 Model 80.

Inside, new power supplies, a sophisticated cooling system and an optional battery backup, which makes power failures transparent to the software, convince even the most skeptical of users that the machine is extremely reliable. IBM's ARTIC coprocessor provides the communications interfaces,

Continued on page 46

Networking is in their bones

Harvard Medical School links Boston hospitals via high-speed networks

ON SITE

BY MARYFRAN JOHNSON
CW STAFF

BOSTON — In a locked closet just outside the data center at Harvard Medical School stand the 134-year-old bones of Dr. John Collins Warren, professor emeritus of anatomy and surgery.

"We like to keep our skeletons right in the closet nearby," Jim Fitchett said with an amiable grin.

As Harvard Medical's first director of information services — and the driving force behind an extensive, fiber-optic networking project linking the medical school with five Boston hospitals — Fitchett shares more than floor space with old Doc Warren.

Both men have a touch of the promoter in their personalities.

The doctor founded Harvard's Museum of Medical Abnormalities in 1847 to promote the study of anatomy, decreeing in his will that his remains forever reside with the bizarre historical collection, now housed next to the main computer room.

The IS director's promotional tastes, however, run more to the joys of information-sharing via high-speed data networks.

"I'm from the school of believers that networking is the future of IS," said Fitchett, who arrived at Harvard Medical School in May 1988 from the IS vice-presidency at St. Lawrence University in Canton, N.Y.

Harvard Medical's *Fitchett says networking is the future of IS*

His charge was to redefine the role played by information technology at the 208-year-old medical school.

"The burden is on me to demonstrate the value of IS as a strategic resource," Fitchett said. "This is a very conservative place, a place very slow to embrace technology."

First on his list was rewiring the campus with fiber-optic cable at a cost of roughly $2 million from his $4 million project budget. One result is the recently activated Harvard Longwood Campus (HLC) Network, which links all 22 school buildings via Ethernet to the data center's two Hewlett-Packard Co. HP 3000 minicomputers and a Digital Equipment Corp. Microvax 3300.

A few weeks ago, Fitchett also switched on an Integrated Services Digital Network (ISDN) from AT&T, bringing voice and data transmission capabilities at 9.6K bit/sec. to all 3,100 dual-jack, voice/data phone lines on the medical school's campus. Harvard University is currently in the process of moving its 19,000 phones onto ISDN as well, he noted.

"This rewiring will save us a fortune when faculty or staff move from one office to another," Fitchett explained. "We were estimating $1,500 per person with every move because of our 20-year-old wiring."

On a grander scale, Fitchett is in the midst of establishing an exterior network — Ethernet-based and entirely fiber-optic — that links Harvard Medical with five area hospitals, Harvard University and the Massachusetts College of Pharmacy.

The Boston hospitals participating in the project are Brigham & Women's, Children's, New England Deaconess and Beth Israel Hospitals and the Dana Farber Cancer Institute.

Everybody's talkin'

In its first month of operation, an exterior network, the Longwood Medical Area Network (LMA Net), has already enabled an electronic mail merger among 1,000 medical school users on HLC and 4,000 doctors and staff members at Children's Hospital.

The goal of LMA Net is to allow sharing of data, E-mail and electronic services such as access to the different libraries and databases, Fitchett said.

Networking has emerged as the most crucial part of Harvard Medical's IS strategy because of the complex, far-flung nature of the medical area, he explained.

As a medical school with no

Continued on page 46

Managing the other half of AT&T nets

IN PERSON

William Gilbert became the director of AT&T's newly formed Network Management Unit on Jan. 15. He was formerly division manager of network management systems, responsible for AT&T's Open Systems Interconnect products and strategies, and service-oriented offerings within the management arena.

With his recent appointment, Gilbert picked up "the other half" of AT&T's network management product line: in particular, the Accumaster Integrator, which acts as a focal point for managing private networking equipment and IBM hosts.

Computerworld *senior editor Elisabeth Horwitt interviewed Gilbert at the recent Communications Network '90 conference.*

What does AT&T see as key strategic areas that it needs to focus on in the area of network management?

You can expect some new stuff in the not-too-distant future, mostly geared to staying ahead of Sprint and MCI on the network management side. We are also trying to educate users about what Accumaster Integrator is about — right now users don't see it as something that automatically occupies a spot on their networks.

In what areas of network management does AT&T plan to provide new products and enhancements to address user needs better?

One of the key areas needed is automation. The first release of Accumaster had a limited a-

AT&T's Gilbert: *LAN management is everyone's hot button*

mount. Once you have the interfaces (to various networking products), the operator can take action, but we want to automate those actions some with a rule-based system.

Accumaster can now accept alarms; using ES, it might say, "this modem is the likely cause." We would like it to then be able to initiate a test, preferably through an OSI link, and if it gets results, send a trouble ticket to dispatch the appropriate technician. That's high value.

Do you plan to make Accumaster Integrator do kitchen-sink management — that is, everything from monitoring to troubleshooting to capacity planning to administration to billing?

Our objective is not to do everything but the kitchen sink, but to focus on applications that add value. We think there is a need for administrative systems like inventory and ticketing, but it's not clear yet that billing functions would make sense on the integrator.

We anticipate providing interfaces to administrative systems like Westinghouse's. If there are half a dozen good existing inventory systems, AT&T doesn't need to provide a seventh.

We do have experience in troubleshooting and keeping networks up, and that's what we'll go with.

What are your plans to expand Accumaster Integrator in the local-area network (LAN) management area?

LAN management is everyone's hot button. We need an element manager system (for LANs) in our architecture; there is none now. I expect 3Com and Novell will provide good ones. And Sun

Continued on page 44

Inside

- Networld '90 brings products for Ethernet standards. Page 44.
- IBM announces modifications to Netview/PC. Page 44.

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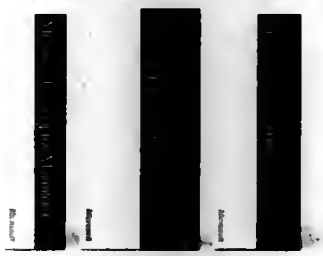

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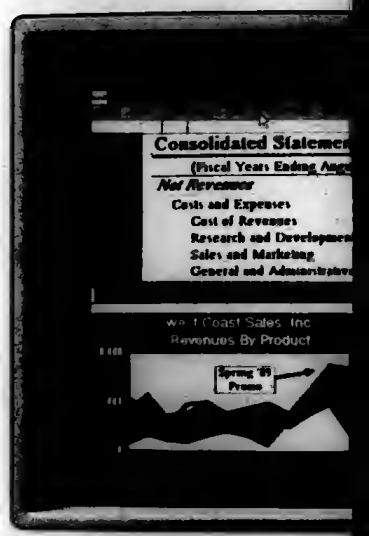

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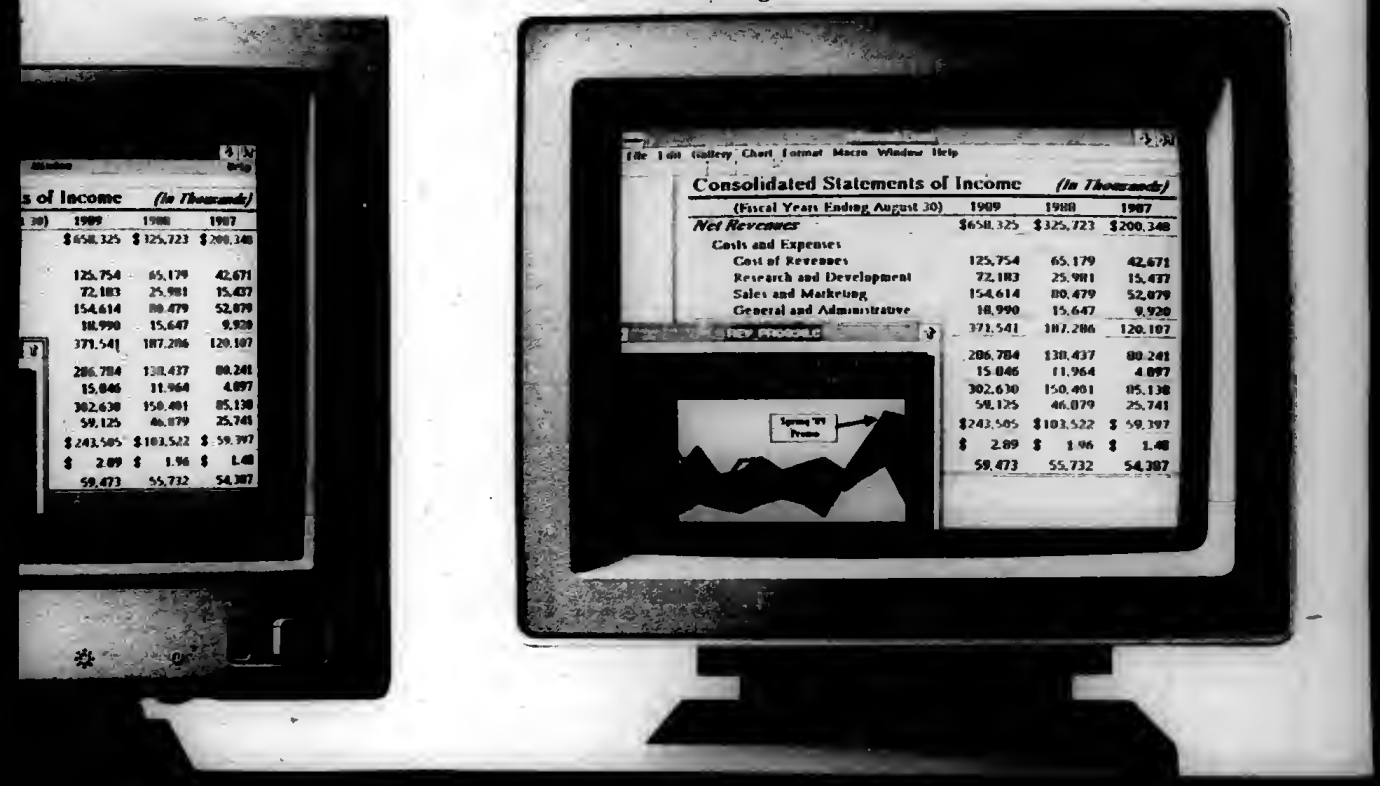

IBM adds Netview enhancements

BY ELISABETH HORWITT
CW STAFF

WHITE PLAINS, N.Y. — With the announcement of March 30 availability for Netview/PC Version 1.2, the OS/2 Extended Edition version of its Netview interface, IBM also introduced an enhanced release, Version 1.2.1.

One key enhancement IBM introduced with Version 1.2.1 was the Remote Console Facility, which is said to allow a user at one OS/2-based Netview/PC console to take over the operations of a console at another site, "so that, for instance, a New York operator can take over when the California operator goes home," IBM network management planning manager Stanley Kimer said.

The second major Version 1.2.1 enhancement announced was the Screenless Netview/PC Gateway, which provides all the standard Netview/PC functions except for the prewritten user screens that have been standard elements up to now, Kimer said.

Systems integrators and vendors can use IBM's Netview/PC Application Programming Interface/Communications System to generate screens according to the individual customer's needs, he added.

The gateway also makes it possible to eliminate those IBM screens that require a user response, bringing users closer to their ideal of unattended operations, according to Kimer. Netview applications can be developed that respond automatically to network events that formerly required human intervention, he said.

The gateway's alert-logging option will allow users to store network statistics collected by Netview/PC in a centralized database — once IBM delivers on its statement of direction to provide a database with an "open interface" that can accept data from non-IBM systems, Kimer said.

Netview/PC Version 1.2.1 will be priced at $3,150.

IBM also announced agreements under which several of its Authorized Application Specialist business partners will be able to market and install its Netview family of products. The partners include Diederich & Associates in South Pasadena, Calif.; Computer Task Group, Inc. in Buffalo, N.Y.; Forrest Ford Consultants, Inc. in St. Louis; Interlink Computer Sciences, Inc. in Freemont, Calif.; and The RFD Co. based in Austin, Texas.

10BASE-T gaining

Standard gathers support at Networld '90 show

BY JOANIE M. WEXLER
CW STAFF

BOSTON — The emerging 10BASE-T standard for Ethernet transmission over unshielded twisted-pair wire is not completely tucked into bed. But it has reached enough technical maturity for a host of vendors at the recent Networld '90 show to risk unleashing products that support the standard's current version.

In addition, the Networld '90 show's network represented the first public demonstration of 10BASE-T product interoperability.

There is a chance, however, that since the standard has not been officially adopted, the currently interoperable products will have to be altered when the draft is ultimately voted into effect — a move that is expected in September.

Unshielded twisted pair (telephone-type wiring) is smaller and physically more flexible than other types of cabling, such as coaxial. Its proponents said it is particularly useful in common office setups using modular furniture.

Penny-pinching

Unshielded twisted-pair wiring is also less expensive than coaxial cable, which is still considered a suitable medium for local-area network backbone applications.

Several vendors introduced 10BASE-T products, many of which ran on the show network:

• Racal Interlan introduced data link controllers, which are currently shipping, on three bus platforms: a $450, 8-bit IBM Personal Computer XT/AT card with an RJ-45 connector for workstations and servers that connect to 10BASE-T networks; a $550 16-bit AT bus card; and a $625 Nubus card that adds the Apple Computer, Inc. Macintosh II to the 10BASE-T twisted-pair network.

In addition, a $240 media access unit from Racal Interlan reportedly allows any vendor's Ethernet products with a thick Ethernet connection to be used in 10BASE-T networks. The company also announced 16-bit bus cards for Novell, Inc. Netware workstations and servers.

• Synoptics Communications, Inc. released a Lattisnet 10BASE-T line that includes two host modules and a transceiver and costs approximately $325 per node.

• David Systems offered up its Volksnet Hub for networks of six to 40 users, which is scheduled to ship March 1. At a cost of $99.95 per port, the hub offers 12 twisted-pair data link ports for workstations.

• Western Digital announced that it is now shipping LAN adapters that were announced last month for IBM PC XT-, AT- and Micro Channel Architecture-compatible systems. Those products, however, are based on the 10BASE-T Draft 9 specification; the current version of 10BASE-T is Draft 10.

In another development, a consortium of users and vendors was founded recently at the University of New Hampshire to facilitate independent 10BASE-T product testing at the UNH Interoperability Lab.

The main purpose of the consortium is to give users confidence that their products will operate in a heterogeneous environment.

LAN/WAN integration looms on the horizon

BY SALLY CUSACK
CW STAFF

WASHINGTON, D.C. — The time may be ripe for LAN/WAN integration products, with users moving from isolated islands of work-group local-area networks to corporatewide internetworking platforms.

LANs are now part of corporate strategy, said Rick Villars, manager of computer networking at International Data Corp. a research firm based in Framingham, Mass. Noting the string of announcements at the recent Communication Networks '90 show, he said the LAN/WAN industry is in great shape, with room for everyone.

"Companies like General Datacomm, Inc., having built much of their reputation in wide-area connection, are now getting to the local-area stuff," he said, "whereas the local-area network people, such as Alantec and Vitalink, are now announcing wide-area networking products."

Products taking their first bows at Comnet included the following:

• General Datacomm in Middlebury, Conn., introduced a system for integrating local and remote LANs at high speeds into a single network. Dubbed Megabridge, the product provides protocol-transparent connectivity between similar LANs (such as Ethernet, Starlan and token-ring) and 56K bit/sec. DDS and T1 connections to a WAN backbone. The product is priced from $7,000.

• NCR Comten expanded its Token-Ring LAN capabilities by unveiling the Bridgeport series, a set of token-ring bridges and related peripherals. The series was designed to allow users to interconnect token-ring LANs and their wide-area networks, the company said, and the series is available in three models: the 7404, which interconnects two 4M bit/sec. token-ring LANs at the same site; the 7604, which bridges a 4M bit/sec. token-ring with a 16M bit/sec. ring at the same site; and the 7412, which interconnects remote 4M bit/sec. token-ring LANs over T1 links. Pricing ranges from $4,895 to $6,488.

• TRW, Inc.'s Information Networks Division announced a high-speed Ethernet-to-Ethernet bridge. The NB2010 is a MAC layer bridge that stretches the theoretical 14,881 packet/sec. bandwidth limit of Ethernet, because it is capable of filtering 23,000 and forwarding more than 14,000 packet/sec. Based on an Intel Corp. 80376 microprocessor, the product costs $4,995.

• Fremont, Calif.-based Vitalink Communications Corp. announced enhancements to its Translan III Ethernet remote bridge. The product includes a function to prevent multicast storms on a LAN from degrading the performance of an enterprisewide bridged network. The software will be available for Translan III in June, and the new features will be extended to the entire Vitalink product line by the fourth quarter. The Translan III, including software, costs $14,250.

• Alantec, also in Fremont, Calif., announced a T1 interface capability for its Multilan Switch (MLS). The T1IM interface module permits the switch to link as many as eight LANs to a T1 WAN connection and supports both standard and fractional T1 connections. The T1IM software controls the number of active T1 transmission channels up to a maximum of 24 and the MLS supports any multiple of those channels, up to the full 1.5M bit/sec. T1 bandwidth. The MLS costs $8,800, and the T1IM is priced at $3,300.

AT&T

FROM PAGE 41

has a network management product that it is encouraging bridge and router vendors to build on. We will certainly be talking with those vendors, but they are not big players in the LAN market, so we have less influence.

Are there any other key network management announcements that AT&T is working on?

Another area we're working on is the [network integration] service side. We introduced Accumaster Management Services when we introduced the Integrator, which is keyed into [helping companies with] network planning and less to helping them run their operations. It isn't just for Integrator customers, but probably the majority of those buying the Integrator want those services to help them start up the system, integrate it and set up databases. What we hear most often is, "I have a business to run; I have efficiency and availability issues I need to deal with; my network is growing; I want help."

Network planning tools were on the bottom of the lists of users that I talked to; fault and performance management and even inventory came out higher.

You provide management of IBM SNA networks through Cincom Systems, Inc.'s Netmaster product. Do you have any plans to provide similar services to other hosts besides IBM's and your own?

Unisys has bought the Integrator [to manage its own products]. I suspect Unisys and IBM hosts won't be the only ones we manage. Unix is a natural area for us.

Are any other alliances in the works?

We are exploring about half a dozen alliances actively and another dozen tentatively. We clearly need an interface to several inventory systems, for example.

Overall, what needs to happen in the network management industry?

The customer sees network management as a series of systems he has to integrate so they can work together. Today, there is a lot of talk about interfaces, but that's just the first step so that they can all talk. We need applications so that they can do something useful.

To know for sure, you'd need a time machine...

Jackowski

CONTINUED FROM PAGE 41

both offloading the CPUs and allowing users to customize their own protocol and device support. In addition, any MCA device can be connected to the 9370. All this and the machine can be operated and powered up remotely without operator intervention.

Still, what can be done with a 370 and a tightly coupled personal computer?

The initial impression might be that it would make an excellent local-area network server. Putting a LAN server in the same box with IBM's VTAM eliminates the need for a LAN gateway. After all, VTAM can connect to any SNA system. In fact, Phaser Systems, Inc., in San Francisco is running Novell's Netware on the 9370.

Looking further, executives at major retailers have said that they would put an IBM 370 in every store for applications compatibility with their mainframes if they could afford it. Now they can. This machine will make an excellent distributed processor that can easily connect to corporate mainframes.

What about IBM's other connectivity box, the Series/1? With more than 100,000 units shipped, IBM has no follow-on product. Users with hundreds of thousands of lines of code are left stranded. Yet, virtually nothing that is currently done bypasses a Series/1. Most major retailers, financial services, banks and insurance companies use the Series/1 to perform protocol conversion functions to bring non-IBM devices to mainframe-controlled SNA networks. Supermarket scanners, point-of-sale devices, Touch-Tone audio response and process control — it has been said that the Series/1 could connect to anything. Now, so can a 370.

However, as we look at the industry as a whole, we see the mainframe base slipping away. Proliferation of minicomputers and PCs has forced most large computer users to redistribute their processing on these less expensive devices. This has led to penetration of formerly "blue" shops by non-IBM vendors. As distributed requirements have grown, so have the capabilities of the non-IBM suppliers' products.

Furthermore, since there are many more PCs and minicomputers than mainframes, software houses have concentrated on development of applications for the smaller machines. Who could afford to purchase an IBM mainframe for development of software? This, too, has indirectly affected the appeal of the IBM 370 line, as there are relatively few new 370 applications developed.

Now, introduction of the new 9370 will change the industry. IBM has promised quantity discount pricing on a machine that is affordable for even a modest software development company. Its connectivity features are virtually unlimited, and its reliability goes far beyond that of PCs and many minicomputers. With the use of communications coprocessors and a parallel Intel 80386 CPU, performance will surprise many people.

Companies such as Sears, Roebuck and Co. have already purchased hundreds of systems. Thousands of additional systems will be installed as Series/1 replacements, and the 9370 will emerge as the IBM connectivity box. So, while we haven't heard much about it, don't be surprised if the new 9370 becomes the sleeper product of the 1990s.

Jackowski is president of Sysygy Communications, Inc., a Scotts Valley, Calif., consulting and systems integration firm that was a beta-test site for the new IBM 9370.

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Bones

CONTINUED FROM PAGE 41

hospital to call its own, Harvard has collaborative partnerships with 15 Boston-area hospitals, where HMS students spend two years or more working. The 1,000 medical school faculty members on campus are augmented by as many as 10,000 researchers and physicians scattered throughout the affiliated hospitals.

Since there is no common computing platform among the different institutions, each provides its own gateway to LMA Net. To establish a common E-mail system, for example, all of the participants agreed to use E-mail packages based on the CCITT X.400 standard.

"The beauty of the LMA network is that I don't have to spend any money for it, just have everyone conform to a standard," Fitchett said.

Available over LMA Net is a database from the National Institutes of Health, which covers currently funded research. A full-text scanner attached to Harvard Medical's Microvax can be accessed by HMS staff and Children's Hospital staff to scan a half-dozen medical databases.

By the end of March, the IS director hopes to offer anyone on the network a $250 yearly subscription for unlimited database searching through the text scanner. Eventually, he plans to include a bulletin board that will notify network users of guest lecturers and presentations taking place at any of the institutions.

Along with his multifaceted networking projects, Fitchett and his staff of 31 are also exploring ways to provide a "common look and feel" to the LMA Net from any personal computer or workstation with access to it. In addition, the IS department is immersed in a project to replace the current HP-based database with a relational database, probably on a non-HP platform.

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NEW PRODUCTS

Local-area networking hardware

A new family of unshielded twisted-pair IEEE 802.3-compatible Ethernet local-area network adapters has been introduced by Gateway Communications, Inc.

The products — G/Ethertwist PC, G/Ethertwist PC-WS, G/Ethertwist AT and G/Ethertwist AT-WS — were designed for the IBM Personal Computer XT, AT, Personal System/2-30 and Intel Corp. 80386-based machines. The adapters offer communications and queueing software and extended on-board memory (64K bytes of random-access memory for the 16-bit G/Ethertwist, 40K bytes of RAM for the G/Ethertwist 8-bit PC).

Prices are $370 for G/Ethertwist PC, $345 for G/Ethertwist PC-WS, $445 for G/Ethertwist AT and $425 for G/Ethertwist AT-WS.

Gateway Communications
2941 Alton Ave.
Irvine, Calif. 92714
714-553-1555

Local-area networking software

The Software Link, Inc. has begun shipping Release 2.2 of its laptop local-area network, Lanlink Laptop.

Release 2.2 supports nondedicated server access on DOS-based machines through a multitasking terminate-stay-resident program, thereby enabling DOS users to undergo file transfers without having to suspend applications at the server.

With Release 2.2, Lanlink Laptop can be designated as a server or a satellite, the vendor said. Users can share drives, printers and other peripherals; execute commands and programs across LANs; and allow programs to access data files across LANs.

The system can support a 500K bit/sec. data transfer rate and serial connections over RS-232 cable. The product runs on IBM Personal Computer XT, AT or Personal System/2-compatibles.

It sells for $139.95.

The Software Link
3577 Parkway Lane
Norcross, Ga. 30092
404-448-5465

Network management

Advanced Computer Communications has unveiled the ACS 4810, a local-area network monitor that enables network managers to monitor all Ethernet LANs from a central ACS 4800 management station.

The product tracks traffic and usage patterns on a LAN segment and forwards the information to a centrally located ACS 4800 management console, thereby enabling network administrators to manage internetworking devices and individual nodes on an Ethernet LAN, the vendor said. The monitor's user-defined thresholds enable managers to set their own alarm criteria. It can communicate through routers and bridges, allowing it to respond to the ACS 4800 management console during a network failure.

The ACS 4810 will be available in April 1990 for $4,500.

Advanced Computer
720 Santa Barbara St.
Santa Barbara, Calif. 93101
800-444-7854

Northern Telecom, Inc. has announced DPN Advisor, an enhanced data network management package for the DPN-100 digital data packet networking system.

The product gathers and consolidates status information from the entire DPN-100 network and produces maps and graphic displays of network status and alarms in real time, the vendor said.

An optional expert system, DPN Expert Advisor, correlates multiple alarms to determine the most likely problem, obviating the need for network managers to sort through multiple alarms to isolate critical problems.

DPN Advisor will come equipped with a Sun Microsystems, Inc. Sun-3 Unix-based workstation. It is scheduled to ship in April 1990, while DPN Expert Advisor software is slated to ship in September 1990. Prices are to be determined.

Northern Telecom
200 Athens Way
Nashville, Tenn. 37228
615-734-4251

Modems

Forval America, Inc. plans to deliver a 14.4K bit/sec. internal dial-up modem card for IBM Personal Computer/ATs and compatibles during first-quarter 1990. The IM14400, which conforms to the V.42bis CCITT standard, will compress data for 57.6K bit/sec. throughput when operating with another IM14400 and transmission speeds to 28.8K bit/sec.

Downloadable software, Forval-Link will allow users to custom-configure the IM14400 for speed, security algorithms and other features, the firm said. Standalone and rack-mounted IM14400s are slated for shipping during second-quarter 1990. List price for the internal card is $1045, though an $836 introductory price is currently available.

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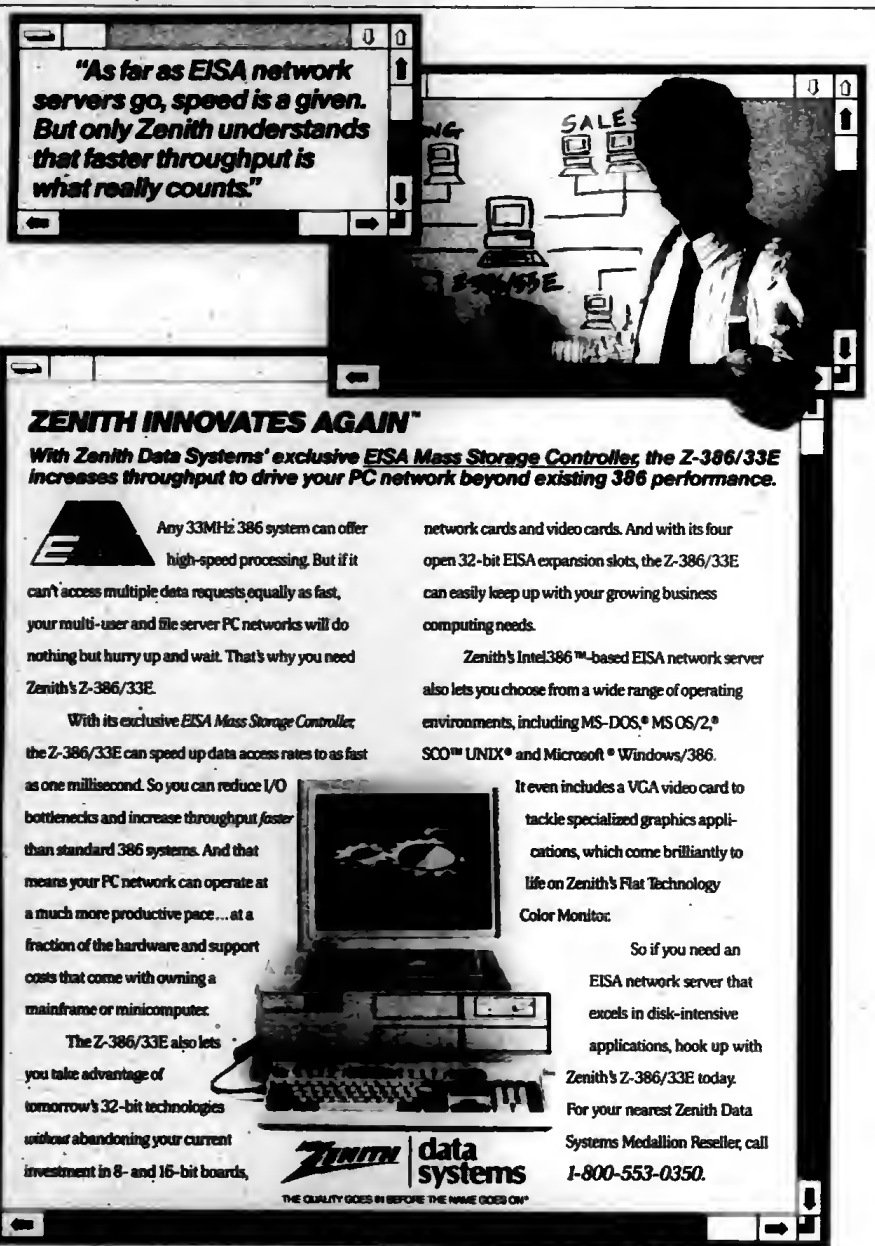

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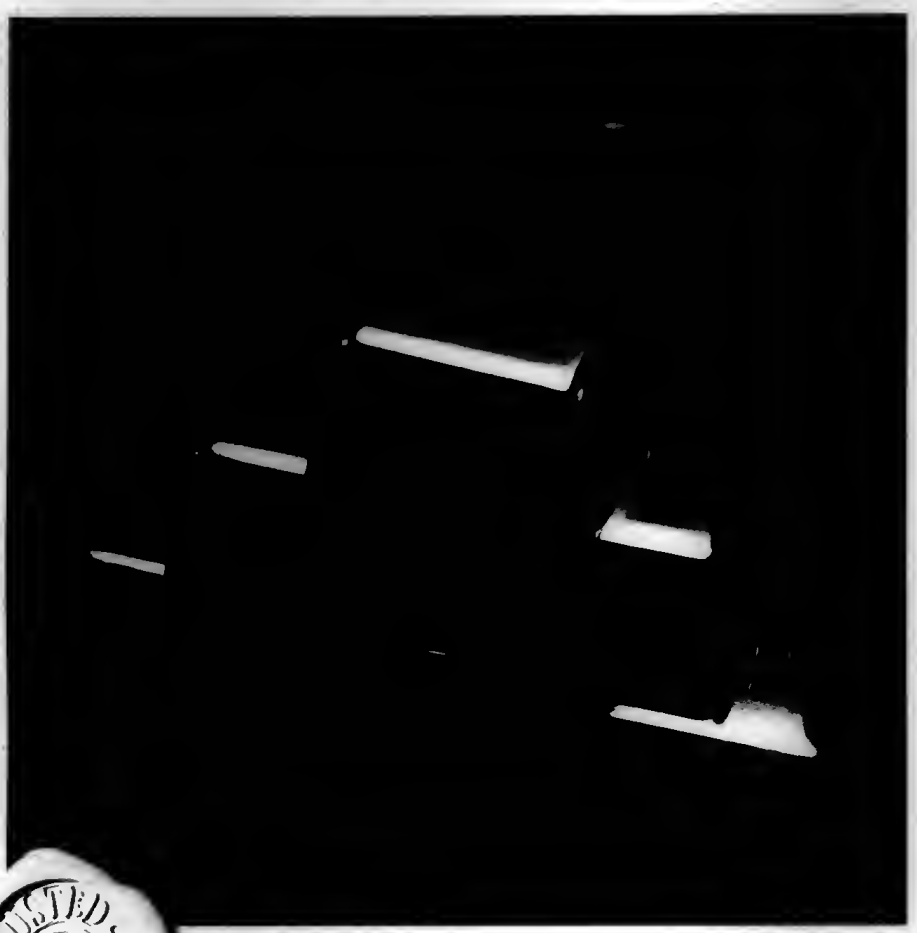

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MANAGER'S JOURNAL

EXECUTIVE TRACK

Vincent L. Morrotti has been named general manager of organization and information systems at **Mercedes-Benz of North America, Inc.** in Montvale, N.J.

Morrotti is responsible for planning, organizing and managing all aspects of the company's information systems. He joined Mercedes-Benz from Saab-Scania of America, Inc. in Orange, Conn., where he was manager of IS.

Morrotti holds a bachelor's degree in computer science from the University of New Haven.

Richard R. Dykes has been named vice-president of corporate information systems at **Williams-Sonoma, Inc.**, a San Francisco-based chain of specialty retail stores. He was most recently vice-president of management information and corporate services at Pay-n-Save Drug Stores, Inc. in Seattle.

Karl Litzenberg has been named vice-president of operations at **Omnicom, Inc.**, an Open Systems Interconnect education firm based in Vienna, Va.

Litzenberg was formerly information systems director at *USA Today* in Arlington, Va., and served as vice-president of Corporation for Open Systems.

At Omnicom, he will oversee the newly-created operations activity, which comprises marketing communications, financial management, graphics and business planning.

Who's on the go?

Changing jobs? Promoting an assistant? Your peers want to know who is coming and going, and *Computerworld* wants to help by mentioning any IS job changes in Executive Track. When you have news about staff changes, be sure to drop a note and photo or have your public relations department write to Clinton Wilder, Senior Editor, Management, *Computerworld*, Box 9171, 375 Cochituate Road, Framingham, Mass. 01701-9171.

Bridging tech, functional barriers

Life of Riley calls for Manufacturers Hanover systems overhaul — without big bucks

BY MARYFRAN JOHNSON
CW STAFF

A conversation with Elven Riley may start out with computers but end up at the architectural wonder of the Greek Parthenon.

Along the way, the vice-president in the investment banking division at Manufacturers Hanover Trust Co. (MHT) will shuttle his listener through a few quick sidetrips to the world of corporate buzzwords, high-tech hype and business realities.

"My personal style is to do a lot of verbal connecting with people," he says with a grin. "I probably do too much of it."

The 39-year-old Riley is chief systems architect — a kind of business-technology liaison — in an extensive "cross products" planning process now under way in the New York-based firm's investment banking division.

"Cross products" refers to any financial applications or data used across the company's multiple platforms, which include IBM and Digital Equipment Corp. midrange machines and personal computers. The aim of the plan is to squeeze the broadest and best use from the bank's existing computer resources without revolutionary change or staggering expense. "I see myself as writing Chapter 2, not burning Chapter 1," Riley says.

The initial draft of Riley's plan is due to upper management in April. "I am looking at what kinds of applications or technologies we need to support multiple business products, such as trading in government bonds, foreign exchange, futures and options — a whole gaggle of stuff," he says.

One recent example of cross-product planning at MHT was Riley's choice of Oracle Corp.'s relational database management system, which is running now in a pilot version on the data center's DEC Vaxcluster.

Joyce Ravid

Manufacturers Hanover's *Riley takes a variety of experiences into planning the best use of several platforms in the firm's investment banking group*

"The intent is not to say Oracle is the only database manager you can use," he says. "Someone on a standalone PC can use what he wants. This is intended for the strategic data that must be captured and maintained as part of critical business planning."

Aside from such tactical moves, Riley's job encompasses strategic planning and management of all trading floor technology for the investment banking division. "Banks are ready to restructure and change, and that can be helped or hindered by technology," Riley explains. "The investment banking arena is a rather new, freshly laid backyard in technology."

Continued on page 58

An electronic classroom for studies in IS

BY CLINTON WILDER
CW STAFF

If you're going to teach information management in the 1990s, who needs a classroom? Why not use the information technology that can bring together students and teachers located thousands of miles apart?

That's the philosophy of the International School of Information Management (ISIM), a 1½-year-old institution based in Santa Barbara, Calif. None of its 100 students stroll to classes in the sunshine of the California coast. In fact, they don't stroll anywhere — they don't even leave the confines of their offices in the information systems departments of Fortune 500 companies.

The ISIM curriculum — ranging from a single course in word processing to a full master's degree program in information resource management — is offered exclusively on-line. After receiving course materials in the mail, students "attend" class on their desktops through asynchronous links to the Telenet or Connect information networks. With electronic mail, students can easily communicate with each other as well as with faculty members.

"People should not have to come to the classroom to learn," says ISIM founder Eric H. Boehm, the 71-year-old retired president of reference book and database publisher ABC-Clio. "The classroom should come to them."

The same holds true for faculty members who are scattered around the country. The "electronic professors" include IS valuation specialist Paul Strassmann, federal government IS consultant Forest "Woody" Horton, Shearson Lehman Hutton, Inc. Vic-President Julia Galosy, senior researcher Rod Monger of The Research Board and several university IS professors.

Course fees, in the $1,300 to $1,600 range, include 10 hours of on-line charges. Students have ranged from systems analysts to IS directors and chief executive officers; only 20% so far have chosen to pursue the full master's program. Many already have master's degrees, Boehm notes.

TAKING CHARGE

Max Messmer

A new set of IS skills for the '90s

A popular speaker once said, "I don't trust computers, and I don't trust people who mess with them, either."

If the information systems department is going to come into its own in the 1990s, the onus is going to be on the individuals within it to gain the understanding, respect and trust of the rest of the organization.

IS people need to develop their business and interpersonal skills. They must gain a complete understanding of their organization, its mission and its goals, because their function affects the results of every other department.

The 1990s also call for a "new breed" of IS professional. Not many years ago, the criterion for a systems analyst position was a programmer with a few extra years of experience.

Today, however, that same position might require two to four years of commercial lending experience, or three to four years of product design. In addition, in an area in which an IS professional could once have expected to spend his career quietly locked away in the IS department, the '90s will see these people integrated into the mainstream of the organization.

The major trends affecting the IS function — dispersal, outsourcing and decentralization — each carry their own set of implications for getting ahead in the new decade. Let's look at the impact of each:

Dispersal. Moving IS people into other functional areas will have a much larger and clearly positive effect on careers. It will open up the opportunity for people — *and* the IS function — to grow in a number of different directions. An assignment in insurance claims processing or quality assurance, for example, will immerse the IS person in the real-world problems of the organization. This, in turn, will result in the shortest path to designing information systems that create real-world solutions.

Outsourcing. This will bring significant change — and opportunity — to both technical and management careers. As in-house departments are replaced by outside contractors, IS people will suddenly find themselves working in an accountable profit center with their former employer as a customer in every sense of the word.

The large outsourcing organizations are substantially larger than most IS departments, with many more diverse technical and management opportunities. The competition for advancement may be tougher, but both the financial and psychological rewards are usually higher in a profit center than they are in a staff department.

Managers at outsourcing vendors should implement special orientation programs to ease the transition of people coming from staff positions, help them learn the ropes and reach peak productivity as quickly as possible.

Decentralization. Of the three trends, decentralization should have the least effect on IS careers. It *will* bring IS people into closer contact with others as smaller regional groups work more directly with the users they support. But unless IS managers make a special push for integration, decentralized people run the risk of suffering both functional and geographic isolation.

The way in which managers approach this issue will determine whether good people perceive the decentralized positions as a training ground for greater things — or as a dead-end job to be avoided at all costs.

Most IS people of the future will report directly to a line function — within a company or an outsourcing organization — for much of the rest of their careers. A purely technical background doesn't give them what they need to succeed in this new environment. IS people should routinely receive people-skills training, on-the-job functional skills training and, for those with management aspirations and potential, appropriate management training.

They should also receive in-depth information on how their organization operates and what it must do to best serve its customers if they are to design systems that are truly business solution-oriented.

In addition, they should be encouraged to learn how similar organizations are using technology so that they begin to problem-solve within the context of a larger universe.

With every technological advance, we get closer to a time when information will drive the success of an organization. The organizations that will be most successful are those that are beginning now to prepare their IS people to share the driver's seat.

Messmer is chairman and CEO of Robert Half International, Inc., a Menlo Park, Calif.-based IS placement service operating Robert Half and Accountemps divisions.

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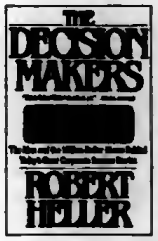
BOOK REVIEW

In praise of the almighty decision

THE DECISION MAKERS: THE MEN AND MILLION-DOLLAR MOVES BEHIND TODAY'S GREAT CORPORATE SUCCESS STORIES
By Robert Heller
Truman Talley Books, $22.50

Decisions make careers. And fortunes. And nations. For better or worse, how we choose projects, products, employees and markets can propel us to business's highest peaks or hurl us, defeated, into the hellish pits of mediocrity, shame, unprofitability and — perish the thought! — failure. So says British business writer Robert Heller in *The Decision Makers*, a pop-business tome that could have been subtitled "Decide your way to power and profits" or "How to beat the Japanese with clearer thinking."



In his latest work, Heller, editor of *Management Today*, a leading British business publication, and author of *The Age of The Common Millionaire, The Naked Manager* and others, makes an appealing pitch: Learn to decide like the winners decide.

Heller shows us that in "The Age of Competition" there is more to analytical decision-making than decision trees, Do loops and number-crunching. He divides decision-makers into six basic types: innovators, expansionists, improvers, planners, salvationists and competitors. In a breakneck 385 pages, we see decision-making, good and bad, from business demigods in every industry from cars to chemicals.

In quick, slick prose, Heller zips through decisions surrounding such winners as Swatch, Nike running shoes, Asahi dry beer, the Ford Taurus, microwave ovens and Ultra Pampers. And losers like Zap Mail, Marxism and The Oil Crisis. We are offered vignettes about Lee Iacocca, Michael Milken, Rupert Murdoch, Akio Morita and dozens of others. The Japanese firms — Honda Motor Co. Ltd., Nomura Securities Co. Ltd., Sony Corp., et al, are never far from mind.

The world of information systems, from Amstrad Computers to IBM, is well represented. Heller brings us into the suites of John Akers, Rod Canion, Ross Perot and other industry big chips.

A lengthy, sometimes disjointed chapter explores the 1988 reorganization of IBM. We see the historical and philosophical underpinnings that led John Akers to undertake "IBM's most sweeping restructuring for three decades." Heller shows how IBM's greatest strength — tradition — transformed it into an inbred, complacent and bloated behemoth savaged by smaller competitors.

Akers eventually realized that IBM had to alter its stodgy, gray-flannel management style. All this background brings perspective to Akers' decision to nurture a decentralized, entrepreneurial IBM.

The practical lessons offered by *The Decision Makers* are too diverse to be summarized easily. Basically, Heller says, good decisions involve intuition, readiness to act, concern with human judgment and careful observation. In case these lessons are not clear, Heller provides a list of key points at each section's end. A sampling: "If you want to achieve big results, make big decisions." "Don't decide on the new by extrapolating from the old." "Involve all relevant people from the start."

No one can fault Heller for being incomplete; the book is a mini-encyclopedia of names and ideas. Yet this broad reach is what makes *The Decision Makers* both engaging and, at times, frustrating. Some anecdotes are less than one page long and end too abruptly. Heller relies heavily on *Business Week* and popular business books for most of his illustrations. Unfortunately, the breathless pace and voluminous details of business journalism do not always translate well into book form.

There is almost too much to digest here. Minor distractions — such as a fondness for horribly cliched platitudes ("Adversity is commonly the mother of success") or racial and ethnic stereotypes (Indians speak with forked tongues; cannibals devour explorers; greedy French chase francs, for example) — further blemish the work. And where are the women? Surely in a work this size, there is room for several examples of savvy women decision-makers. Only one — IBM's Ellen Hancock — is discussed and then only as a subordinate to John Akers. This absence could be a fact of business or a reflection of how the author selected material; probably, it is a bit of both.

Despite these shortcomings, Heller nonetheless has produced an interesting and potentially useful work. Stripped of its self-conscious sagacity, the book is a decent, sometimes clever, blend of synthesis and analysis. Fans of business lore will like the stories; improvement-minded managers will like the lists.

You decide: If you'd like a quick business school course in decision-making and wouldn't mind reading what amounts to "Thought Processes of the Rich and Famous," you might want to drop $22.50 on *The Decision Makers*. Or you might decide to wait for the paperback.

JOSEPH MAGLITTA

Maglitta is a *Computerworld* senior editor, in depth and integration strategies.

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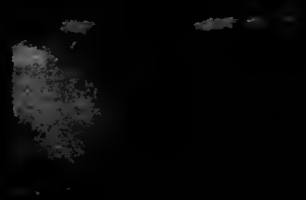

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FROM PAGE 53

Investment banking at Manufacturers Hanover involves $2 trillion worth of worldwide securities trading in 52 currencies annually as well as global underwriting of financial assets, international loan management and corporate finance advisory services. With 2,000 employees, this sector makes up 10% of the 20,000-employee MHT business worldwide. Riley reports to Robert Miller, head of IS for the investment banking sector.

Riley's unusual job is part negotiator, part communicator and part devil's advocate.

"For me to get anything to happen, I need multiple business groups to agree there is a generic or cross-product function and be willing to fund it," he says. "I also have to get the technical groups to agree I'm not crazy on the actual hardware or software choice."

Another spot where cross-products thinking applies is in market data services, which provide the financial fodder supporting all of MHT's foreign exchange trading as well as the bank's own securities corporation, which deals in treasury bills and municipal and government bonds.

RILEY'S unusual job is part negotiator, part communicator and part devil's advocate.

Market data feeds from United Press International, Reuters, Knight-Ridder, Inc., Telerate, Inc., and several bond firms are delivered to the trader terminals via the Rich Triarch System. Widely used in the trading community, the Rich system is a local-area network that moves digital pages of information to monitors and allows keyboard interaction with the data services.

Riley is now laying the groundwork for MHT's own "ticker plant" or market data distribution system, which would act as a specialty adjunct to the Rich Triarch System. The system he envisions would collect data more cheaply on the firm's own customized system, based on a PC LAN — an unusual approach in a field where workstations reign supreme.

The main computer room for the investment banking sector includes seven VAXs in the 6000 and 8000 midrange line, plus a few IBM Application System/400s brought in for specific financial applications, which are still in a nondisclosure testing phase. The sector also has roughly 300 personal computers — mainly Intel Corp. 80286 and 386 machines — linked to the data center.

Riley came to MHT a year ago with an unusual resume blend for an IS professional. His undergraduate degree in computer science from Ohio University was followed by a 15-year career in both IS shops and vendor companies. He was a salesman at Prime Computer, Inc., district marketing manager at Encore Computer Corp., data center manager at the University of Illinois and senior systems engineer at Data General Corp.

Perhaps of keenest interest to Manufacturers Hanover was Riley's five years of trading-floor expertise gathered while at New York brokerage firm Salomon Brothers, Inc., where he helped create a distributed processing platform throughout the firm. When he left Salomon — fortuitously, just two weeks before the October 1987 stock market crash — he was looking for the kind of architectural planning job MHT had just invented.

Among the 150 IS professionals in his division, there is a historical hiring preference for business experience over technical background. That provided a comfortable fit for Riley's approach to technology, which is underscored by a keen awareness of cost justification.

From his dual vantage point on both the seller side and the consumer side of technology, the systems architect found he became "more attuned to how things can get done."

"Techies often miss the obvious, and the business direction of a company can become lost or

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muddled," he says. "Technical people who haven't done sales think the way to market is to present sizzle. That's a silly view."

Salespeople, on the other hand, may see a market opportunity but be unable to translate that into the vocabulary the technical staff understands, he adds.

"If you are relying on business or technical specialists and they walk out, your only alternative is to very quickly find some replacement guns, at the worst possible competitive time," he notes. "The things that define the business need to be understood and kept over time. They should outlive individuals."

Another planning tool Riley is working on is an executive information system customized for the training and documentation needs at Manufacturers Hanover.

In addition, interest in the AS/400 is growing at the bank, Riley notes, because of the machine's extensive acceptance and use in the European community.

One place that makes Riley feel especially at home is MHT's trading room. Manic activity breaks out on a regular basis in the low-ceilinged room, where bright green Astroturf-like carpeting and floor-to-ceiling windows overlook midtown Manhattan. Any trouble with MHT's foreign exchange trading systems immediately goes looking for Riley.

"There's a lot of yelling, screaming and cussing that goes on in here," he says, a fond smile crossing his face.

Just looking

When it comes to workstations, Manufacturers Hanover Trust has been "the wallflower at the dance party," according to Elven Riley.

"There are a lot of technologies out there looking for a business problem to solve," Riley notes. "But often there are *not* a lot of problems that need that particular technology."

Workstations are a prime example. Although the investment banking sector has been eying the powerful, pricey desktop machines for some time now, not a single one has yet to be purchased.

"So far, management has had the self-discipline to say there's no clear case for them," Riley explains. "I have serious reservations about deploying high-cost, high-function workstations when it's not clear all that functionality has a cost benefit."

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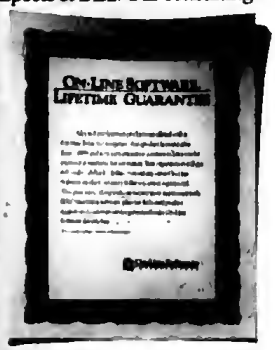

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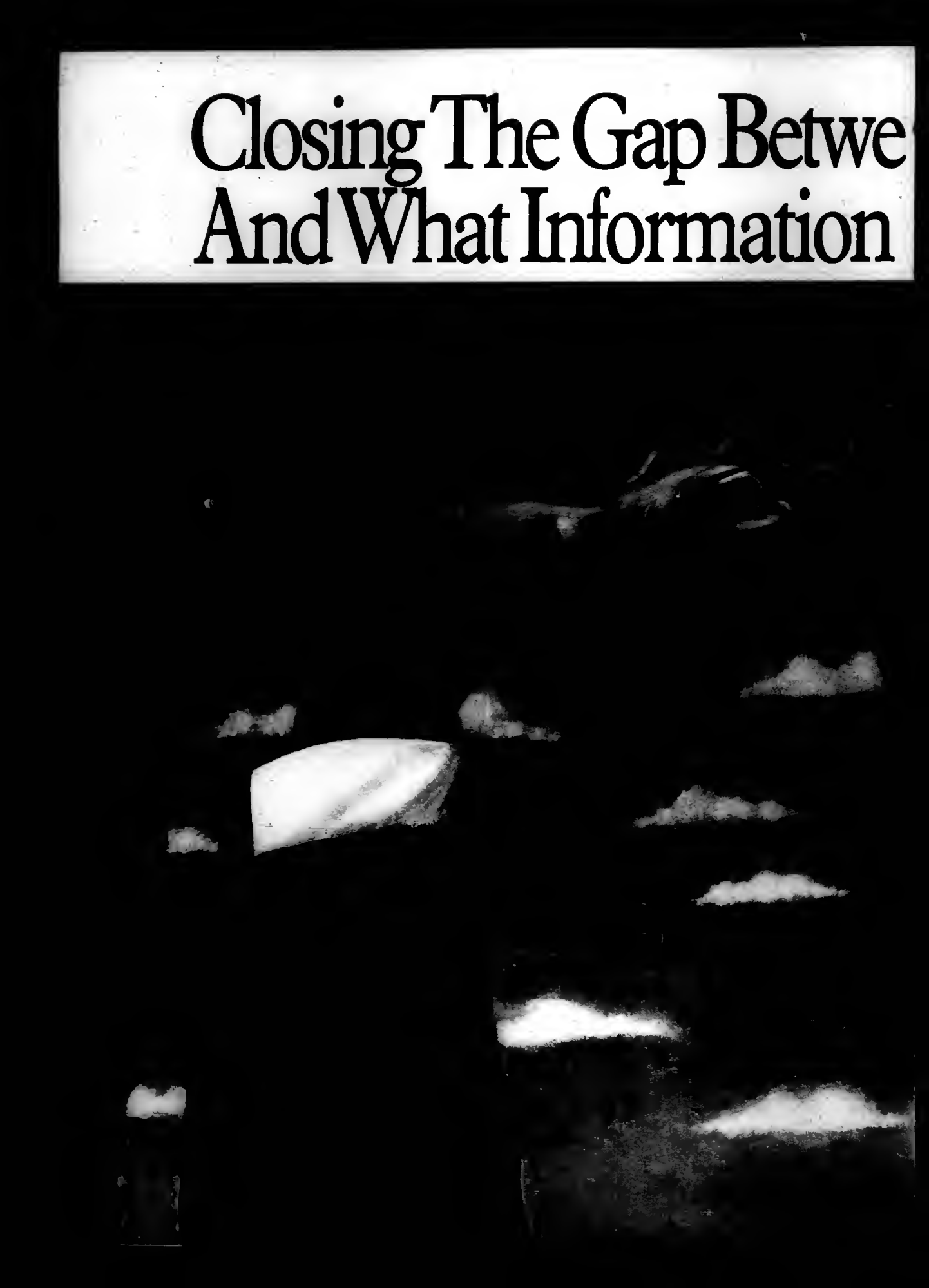

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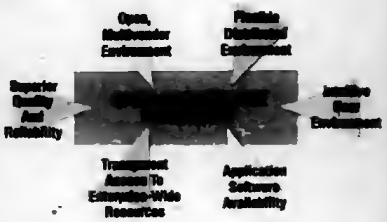

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EXECUTIVE REPORT

DOING MORE FOR LESS

Positive alternatives to slash-and-burn cost-cutting

BY MICHAEL L. SULLIVAN-TRAINOR

Sometimes, a little innovation means a lot. Skip Abadie, a systems programmer at FMC Corp.'s Dallas data center, saved the company $150,000 by writing a program that allowed FMC's largest division to cut its printing volume in half.

Since then, Abadie has become an FMC systems fellow — a special job category allowing technical stars to earn managerial salaries. He received an award of savings bonds for his innovation, and a framed certificate hangs in his home. Notification of Abadie's achievement is posted at the data center along with a host of other certificates for similar achievements by his coworkers.

Such recognition for providing more and better information systems service for less expense is standard procedure at the facility — one of the most cost-effective in the country, according to researchers at Nolan, Norton & Co., based in Lexington, Mass.

"Improving service and reducing costs are embedded in the people and the culture of this building," says Randall J. Gannaway, FMC's data center director.

Take it to the limit

Just as there is a cutting edge in using IS for strategic advantage, there is a hair-raising lead position for IS managers who push the idea of doing more for less as far as it can go. Gannaway is one of a growing band of managers who use every resource at their disposal to set new standards in IS efficiency.

According to Susan Falzon, associate director of Partnership for Research in IS Management (PRISM), the research arm of Index Group, Inc. in Cambridge, Mass., doing more for less has become an increasingly important issue for the 115 Fortune 250 companies that PRISM tracks.

Stan Watercutter

FMC's Gannaway *says success means cutting costs while improving service*

While many managers agree that doing more for less is a worthy goal, the extent to which they apply this philosophy to their operations varies greatly from company to company. In its purest definition, doing more for less means providing more information services for less budgetary expense.

Accomplishing this goal requires altering traditional IS methods such as investing in technology for its own sake or growing just because business volume grows. Rather than converting to this difficult new discipline, some managers try less disruptive tactics — such as eliminating minor application maintenance — to produce small savings.

IS organizations have "become pretty good at making minor changes for incremental gains," Falzon says.

Managers engaged in significant efforts to do more for less may try decentralizing various functions and assigning them to individual business units. However, rather than decrease costs, these efforts often only disperse the same IS budget among different corporate groups, Falzon says.

In fact, the recent recentralization trend — bringing pieces of the IS function back into a central organization — results in part from the need to recapture economies of scale and reduce expenses caused by duplication among decentralized functions.

To capture the order-of-magnitude of savings derived solely from doing more for less, IS managers have two choices: either implement a new discipline in which cost-effectiveness supersedes traditional IS attitudes, or try outsourcing, Falzon says.

If a company possesses the tools and commitment to revamp its IS operations, then calling on an outside supplier may not be the best answer. Outsourcing is a good cost-savings alternative for companies that see their IS functions — particularly their data centers — as inefficient, says Alan Hammersmith, a principal at A. T. Kearney, Inc. in New York. However, he says that outsourcing is usually not cheaper in the long run.

"If the problem with IS is something you can correct, don't think of outsourcing," agrees Robert Suh, an associate at Temple, Barker & Sloane, Inc., based in Lexington, Mass.

Creating a new doing-more-for-less discipline requires a cultural shift in the way IS operates. For example, when FMC, headquartered in Chicago, decided to save costs by consolidating two data center operations into a single center in Dallas, the company assigned a special IS planning group the task of creating a management philosophy that would make it a cost-effective organization from the ground up.

The Dallas data center, established in a former Braniff Airways reservations center in 1981, is ranked in the top 10% of 200 data centers tracked by Nolan Norton. "They are more efficient than most," says Allan Froehlich, senior manager at the management consulting firm. "They spend less on processing and have less money invested in head count than other centers their size. But the overriding thing is that they've really managed the process."

The center's staff of 150 has worked at being intensely cost-effective for nine years, and the

Sullivan-Trainor is a *Computerworld* senior editor.

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Cost-cutting

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fruits of their work are beginning to show. Unit costs, in terms of CPU usage, have decreased 50% since 1986, while usage itself has increased more than 300%, Gannaway says. The center is now operating at 99.9% availability 24 hours a day.

As FMC's main data center, the Dallas site serves 45 locations in the U.S. and overseas. The center runs four IBM 3090 mainframes, an Amdahl Corp. 5890 and a Digital Equipment Corp. Vaxcluster. FMC manufactures defense equipment, machinery and chemicals, with its largest operation, the San Jose, Calif.-based Ground Systems Division, providing 60% of the center's processing load.

With its goal of breaking even on IS expenses in mind, the center returns to the users any chargeback amounts in excess of

"WE DON'T evaluate PC software anymore. On the high end, we've abandoned a lot of the more esoteric considerations like what methodologies you should use for information resource management."

DENNIS MURPHY
GTE

costs. Chargeback costs have been going down at a rate of 15% to 20% a year, and unit costs are currently going down 25% a year, according to Gannaway.

The continual reduction in IS costs at FMC is partially because of an overriding management discipline that emphasizes RAS (reliability, availability and service-ability), a set of performance measurements introduced by IBM for its large systems hardware and software.

FMC's operations are based on meeting ever-advancing goals of reliability, which is reducing the time systems are down; availability, or increasing access to the systems; and service-ability, which means decreasing response time. These statistics are the basis of internal performance evaluations as well as part of service-level agreements that the data center has negotiated with its clients.

Acute attention to RAS measurements is an essential part of management policies at any large data center whose high volume demands a strict understanding of performance. But detailed concentration on RAS is unusual for small- to medium-size centers such as FMC. "Their focus on RAS is very intense, given their size," Froehlich says.

Two key areas in which FMC gets more for less than comparably sized data centers are tape-storage and printing expenses. Tape-storage operation expenditures have been reduced 49% since 1986 through automation, and the labor required for the printing operation has been cut back dramatically through the practice of farming out large volumes of printing to the divisional IS operations that the center services.

The biggest savings, however, comes from a technology acquisition strategy that requires CPUs or direct-access storage devices (DASD) to be swapped in or out of the data center every six months. The reason for this activity is the center's plan to ride the curve of equipment value. Hardware is acquired early in its life cycle after prices have peaked and is then jettisoned before the value is gone.

"Before a box goes in, we analyze everything: the RAS benefits, the technology benefits and especially the economic life of the system," Gannaway says.

A technology acquisition team of four staff members constantly studies consultant residual value predictions and then makes its own assessment. No processor is leased for longer than two years because its value would decline too much, Gannaway says.

This strategy allows FMC to use state-of-the-art systems to gain the greatest efficiency from its processors. But the emphasis on costs may also mean skipping a generation of systems because it doesn't meet the cost/benefit criteria.

"There wasn't a doubt that everyone in the building wanted the 3480 because it was the latest technology," says Joe "Rocco" DeAngelis, who leads the technology acquisition team. "But the systems were tough to justify, so the decision was postponed until the time was right."

IBM's 3380 DASD wasn't so lucky, however. The data center skipped that generation of hardware because the incremental benefits of the 3380 were not worth the expense, DeAngelis says. Now, the center is switching to IBM's latest DASD, the 3390.

After many years of employing these strategies, the center is nearing the point where substantial cost savings can no longer be achieved through efficiency. So the center is now offering its services to companies outside of FMC.

"OUR METHODS now are more like the mid-1970s, so I'm confident that the savings will be big enough to justify the up-front investment."

JAMES HALSEY III
CBS

Currently, 10% of the processing business at the center is provided by non-FMC clients. The staff is also offering DB2 training to other companies as an added revenue generator. Gannaway says he expects a 30% of the business to eventually come from external clients without affecting the service level provided to internal ones.

"If we doubled our volume tomorrow, it would have very little impact on our day-to-day operations because of the methodologies we use," he says.

Instilling a new discipline requires a consistent methodology that acts as an outline for change. In some instances, the outline is formal, as in FMC's case; in others, informal ideas become the focal point.

"The significant cost savings happen when people step back and fundamentally re-examine the way things are done today and look at the way they might be done differently," Falzon says.

The GTE approach

The corporate IS group at GTE Corp. in Stamford, Conn., did just that. After reviewing the company's needs, the group realized that monitoring and measuring corporate IS activities within the various divisions was not contributing to the corporation's bottom line, according to Dennis Murphy, the group's director. Thus, corporate IS greatly reduced its watch-dog function and dedicated itself to leveraging the resources of internal IS functions to provide more service for less expense.

The group carries out this new approach in two key ways: by providing confidential evaluations of the effectiveness of divisional IS activities and by transferring knowledge about cost-effective IS projects from one division to another.

Because of changes in the size of GTE's business in recent years, the corporate IS function has been reduced from 100 to 38 staff members. During the same period, the demands on IS within the company have grown significantly, Murphy says.

The group serves more than 100 business units within GTE. Each unit runs its own IS function. The functions range in size from very large to very small.

Faced with the opposing forces of reduced staff and increased demand, Murphy's group set in place a rule of thumb: If a project is not worth $1 million or more in savings to the company, don't do it.

While occasional exceptions are made for strategic projects, the rule has helped the group eliminate requests for support for less cost-effective projects. For example, the staff would often assist on projects that would improve a single group or individual's productivity by 10% to 15% but not affect the firm overall.

"We don't evaluate PC software anymore," Murphy says. "Likewise, on the high end, we've abandoned a lot of the more esoteric considerations like what methodologies you should use for information resource management. We've had to look outside for support in the few instances where those things have become an issue."

GTE's corporate IS group still provides guidelines to the divisions, but a great deal of time is devoted to the new role of evaluating the performance of IS units within the company.

"We only go in if the business unit asks for our help," Murphy says. "When we find something, we don't go around the company waving a flag about it. We report the results only to the business unit managers."

Often, the group's recommendations involve reorganizing the unit's IS function. For example, one investigation found that application maintenance demands were bogging down a unit's IS organization, preventing new development. Murphy's team recommended the creation of two separate organizations: one devoted to maintenance and one focused on future systems requirements.

In addition to this function, the corporate group acts as a knowledge-transfer point for company IS activities.

"We serve as a switching center — the facilitator for getting different units together to exchange information," Murphy says.

While GTE is obtaining more service for less investment through information exchange, other companies are employing more drastic measures to gain the same end.

Time for a new program

At CBS, Inc. in New York, James Halsey III, vice-president of IS, has decided that his company's applications development efforts must be brought into the 1990s.

"Our methods now are more like the mid-1970s, so I'm confident that the savings will be big enough to justify the up-front investment," Halsey says.

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THOMAS KIERNAN
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This environment will be converted into a local-area network-based shop using the latest in computer-aided software engineering tools and the most efficient systems development methodology. The 95 professionals have been reorganized into two groups: one focusing on transforming applications requirements into actual systems and the other concerned with defining the applications needs in conjunction with internal clients.

Stan Malinowski

Sabre Computer Services' Kiernan

The first group is based at a central location, while the second — made up of business systems analysts — is distributed to various client locations.

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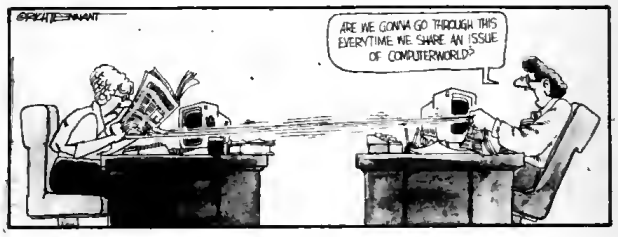

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40. Wholesale/Retail/Trade
50. Business Service (except DP)
60. Government: State/Federal/Local
65. Communications Systems/Public Utilities/ Transportation
70. Mining/Construction/Petroleum/Refining/Agric.
80. Manufacturer of Computers, Computer-Related Systems or Peripherals
85. System Integrators, VARs, Computer Service Bureaus, Software Planning & Consulting Services
90. Computer/Peripheral Dealer/Distr./Retailer
75. User, Other _____
95. Vendor, Other _____
(Please specify)

2. **TITLE/FUNCTION** (Circle one)
IS/MIS/DP MANAGEMENT
19. Chief Information Officer/Vice President/Asst. VP IS/MIS/DP Management
21. Dir./Mgr. MIS Services, Information Center
22. Dir./Mgr. Tech. Planning, Adm. Svcs., Data Comm., Network Sys. Mgt., Dir./Mgr. PC Resources
23. Dir./Mgr. Sys. Development, Sys. Architecture
31. Mgrs., Supvr. of Programming, Software Dev.
32. Programmers, Software Developers
OTHER COMPANY MANAGEMENT
11. President, Owner/Partner, General Mgt.
12. Vice President, Asst. VP
13. Treasurer, Controller, Financial Officer
41. Engineering, Scientific, R&D, Tech. Mgt.
51. Sales & Mktg. Management
OTHER PROFESSIONALS
60. Sys. Integrators/VARs/Consulting Mgt.
70. Medical, Legal, Accounting Mgt.
80. Educator, Journalists, Librarians, Students
99. Others _____
(Please specify)

3. **COMPUTER INVOLVEMENT** (Circle all that apply)
Types of equipment with which you are personally involved either as a user, vendor, or consultant.
A. Mainframes/Supermins
B. Minicomputers/Small Business Computers
C. Microcomputers/Desktops
D. Communications Systems
E. Local Area Networks
F. No Computer Involvement

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learn their businesses," Halsey says.

A three-year program of conversion, the reorganization will require an investment of additional IS funds. However, the actual impact on the IS budget is not yet clear.

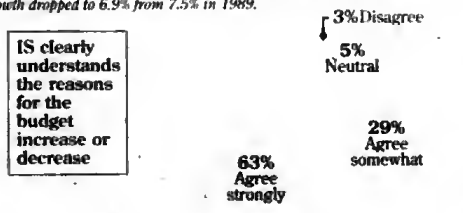
Rather than hard figures, Halsey and CBS' management made the decision based on faith in the benefits that will accrue from the modernization of applications development.

These benefits include fewer systems defects, quicker and better targeted application delivery and less labor for applications development overall. "It's a no utopia, obviously, but we can work smarter on these projects," Halsey says.

Ultimately, Halsey hopes the change will free up some discretionary resources that can be used for additional systems projects.

Loud and clear

Nearly all U.S. IS managers polled say they understand the rationale for their 1990 budget levels. Most managers report increases, but average growth dropped to 6.9% from 7.5% in 1989.



Source: Input Group Inc. CW Chart: Mark Hayes

It's in the air

The idea of modernizing applications development is a key doing-more-for-less strategy. Even the most successful IS operations are re-examining their development procedures to reap the benefits of new methods.

For example, American Airlines is downsizing parts of its Sabre reservations system. Mainframe applications are being broken down and placed on smaller, more accessible CPUs to speed development and boost staff productivity, according to Thomas Kiernan, president of the Sabre Computer Services Division in Dallas.

"Sabre is a very large, complex and integrated single system involving lots of applications and data, and we want to make it more accessible," Kiernan says.

In addition, the Sabre IS group is trying to reduce the complexity of the system by working more closely with users to develop applications.

Size it right

On a much smaller scale, T. Rowe Price, a Baltimore-based investment firm, is using a staff of 52 professionals to provide targeted IS applications on the right size platforms. Rather than rely on a mainframe environment, MIS Director Stephen Martin is concerned with "right sizing" applications to ensure the greatest efficiency.

"We have taken some of our mainframe applications and dropped them into a LAN supported by PCs," he says. "This strategy frees up mainframe cycles and extends the life of the system. Instead of spending $1 million to do an upgrade, I might spend $20,000 to put in a PC network."

Martin was able to delay a $1.2 million mainframe upgrade for five months by downsizing applications.

The company has historically outsourced the majority of its IS work, but as information management has become more critical in recent years, T. Rowe has beefed up its IS operation.

"We bring our in-house resources to bear on those areas where we can add value to the business or where it is of strategic importance to control the information," Martin says.

> "INSTEAD OF spending $1 million to do an upgrade, I might spend $20,000 to put in a PC network."
>
> STEPHEN MARTIN
> T. ROWE PRICE

T. Rowe's outsourcing background creates an atmosphere of tight cost control that drives internal IS.

For example, to carry out the right sizing strategy Martin hires IS professionals who can be trained or have experience in multiple technology environments.

"A CICS batch programmer with no other experience is going to have a heck of a time trying to decide whether an application should run on a PC," Martin says. "He doesn't know the environment, so chances are he'll write the application for CICS."

To provide staff members with a wide variety of experience, Martin assigns them to different projects on a rotating basis. When a consultant is brought in, staff members work closely with him to receive hands-on training.

Unteaching old dogs

While creating multiskilled IS professionals is a key to doing more for less at T. Rowe, getting the staff to unlearn some traditional systems practices has been part of the challenge for Pennwalt Corp., a subsidiary of Atochem NA, a chemical company based in Philadelphia.

The company's strategy of decreasing the IS budget in the face of increasing computer use required giving up research-oriented IS projects in favor of those that directly affect the business units.

"We reduced costs without a general reduction in force," says Robert Rubin, vice-president of IS. "We tried to get closer to the business units to find out their problems. Then we focused all our efforts on their particular problems. We cut way back in areas of research and projects that did not have utility in the near term."

The new IS discipline, which began in 1984, also uncovered cases in which projects were going over budget because the IS staff was trying to deliver the "absolute system." Instead of following that approach, the group focused on building applications "a piece at a time," with prototyping and increased user interaction.

One project that was eliminated under the new order involved an electronic mail system. The system was canceled when a re-examination found that most employees would not have a use for such a system. A commercial automated voice-messaging service was implemented instead at a substantial cost savings.

"We're still doing research, but instead of taking a shotgun approach, we're using a rifle," Rubin says.

The IS department had to pay a price in terms of high staff turnover for the transition to a more cost-oriented style. "Initially, some people were not comfortable working in what was no longer a traditional DP shop," Rubin says.

Another cost-savings method used by Rubin's group is an unusual pricing schedule related to the length of time users are willing to wait for processing. Instead of simply charging users more for peak hours as some shops do, his strategy is to give the control to the users.

If, for example, a user is willing to wait up to two hours for a job to be processed, then he is charged a lower rate than someone who can wait only 15 minutes. The system forces the user to decide how soon he needs the information processed, rather than requiring IS to set the limits.

> "WE TRIED TO get closer to the business units to find out their problems. Then we focused all our efforts on their particular problems. We cut way back in areas of research and projects that did not have utility in the near term."
>
> ROBERT RUBIN
> ATOCHEM NA

Having seen is believing

Experience has made Rubin a believer in the philosophy that the best way to make IS more cost-effective is to make the business process more cost-effective as well. His biggest success occurred when IS spurred personnel and payroll to combine their functions, cutting staff costs in half through attrition.

The change began when IS was assigned the task of combining multiple departmental payroll systems. Rubin's staff convinced management to create a single corporate payroll system, and since personnel review was tied to payroll, record-keeping for that system was combined as well.

"We had one personnel/payroll system and two clients — personnel benefits and treasury," Rubin says. "We then said that since they both operate off the same system, why not merge the two departments? So we did."

Although such measures are effective, they are not likely to be an easy sell. "Since hara-kiri is not the favorite form of amusement in corporate America, you're not going to see middle managers recommending that their departments be merged with some other group," Rubin quips. "Only IS can take a higher level view and recommend such changes. Then it has to be done carefully."

As companies move into the next decade, doing more for less will become the norm rather than the exception. If Rubin's career can be taken as an example, IS managers who capitalize on this trend now by arming themselves with a full set of strategies will gain additional responsibility.

Until recently, Rubin was head of IS at Pennwalt. When Pennwalt's parent company, Elf Aquitaine in Paris, decided to combine its North American holdings — Atochem, Inc., Pennwalt and M&T Chemicals — under Atochem NA, Rubin was placed in charge of IS for the combined company. This new entity is twice the size of Pennwalt, and Rubin reports directly to the chief executive officer.

"This industry," he says, "requires people to be very innovative just to stay even." •

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Looking at decentralization's hazy economics

BY PAUL BERGER

Decentralization is not always as cost-effective as one might believe. Because it is often accomplished through the transfer of application systems to minicomputers or personal computers in individual departments, there is a tendency to think of decentralization as synonymous with downsizing and, therefore, as a cost-saving strategy.

To begin with, it is possible to downsize without decentralizing and vice versa. Many information systems organizations have broadened their hardware repertoires and are using minis and micros now rather than confining themselves solely to mainframe implementations. At the same time, user departments are learning that smaller equipment does not always provide the best method of implementing a major application, and there is no evidence at all that decentralized mainframe data centers are more cost-effective than centralized ones.

Furthermore, even if platforms chosen for business units are minis or PCs, savings may be greater in prospect than practice. On a project-by-project basis, the smaller platforms may seem less costly, but it may actually turn out that adding new applications to an existing mainframe center would be cheaper.

For evidence, look at the first action taken by facilities management companies such as Electronic Data Systems Corp. or IBM. In starting with a new client, they consolidate and reduce the number of data centers, thus lowering their costs for hardware, software, communications, staff, physical plants and utilities.

However, it is often difficult to dislodge the idea that decentralization saves money because it has the effect of spreading the cost of technology around the company and hiding it in many different departments' budgets.

For example, I know of a completely decentralized Fortune 50 manufacturing and service firm in which business unit executives have complete autonomy. They are responsible for delivering profits that meet a predetermined return on assets, and they call the shots on facilities, staffing, capital and information technology resources. The company is a hardware and software vendors' dream. The company gets deep discounts because of the volumes involved, but its total computer investment is several times what it would be if there were some centralization of mainframe resources.

The hard and soft facts

In a decentralized environment, you must clearly provide not only hardware for each site but also the full complement of software to run on it. It is important to consider that although hardware costs are falling, software costs keep climbing. Thus, software is one of the most expensive cost items for a decentralized IS structure. Centralized data centers would reduce both the amount of hardware needed and accompanying software expenses.

Very often in a decentralized environment, each business unit will develop its own applications. In many cases, this software may exist in other parts of the company and could be adopted with a little modification in other sites. The tendency, however, is for each location to develop software for itself, which can create unneeded redundancy of certain applications and extra costs.

Another factor that must be weighed into the equation is staff expense. If a company cannot afford to properly staff and support decentralized IS, then it is getting less for its money by decentralizing. A firm may have to add 20% to 30% to its IS staffing budget to maintain an adequate size organization.

Tough lessons learned

I know of one medium-size company that discovered this the hard way. At the request of operating managers, the company decentralized its application and development staffs but then found it couldn't afford to staff them properly. All of the firm's divisional IS departments are understaffed and overworked. The company cannot afford to hire enough people to properly fill requirements of the divisional and the corporate IS departments. To make it worse, there is little room for job advancement. As a result, attrition is a severe problem. The best remedy for this company is to recentralize its IS staffs, build a critical mass of IS people and set priorities for providing balanced IS support for both divisional and corporate management.

Despite the added costs, decentralization is a legitimate way to bring IS closer to the business in terms of knowledge and orientation. Breaking up the centralized organization and dispersing these staffs to the operating divisions is a way to overcome the problems of isolated and bureaucratic IS departments.

For most organizations, however, neither full centralization nor complete decentralization is the best answer. The wisest approach from both cost and performance perspectives is a mixed environment with both centralization and decentralization. ●

Berger is president of Paul Berger Consulting, Inc. and PBC Management Video Programs, Inc. in Lawrenceville, N.J.

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Store-bought vs. home-cooked

Companies find that ready-to-serve software packages result in savings

BY SHERYL KAY

In analyzing the buy vs. build question, information systems executives agree that certain unique business applications will necessitate creating software in-house regardless of time or monetary considerations. Commercial packages, however, increasingly are finding a place in corporations as IS professionals seek measures to cut costs while maintaining a high level of service to users.

Commercial packages are particularly good for generic types of applications. "Certain systems are just no-brainers," says software analyst Bill McNee at Gartner Group, Inc. in Stamford, Conn., "and there's no reason why any company should build their own."

For example, horizontal business applications, such as accounting, payroll and human resources, are easily and efficiently addressed with packages.

Timesaving

In Maywood, Ill., Tom Wilson, associate director of systems development at Loyola University, can attest to the timesaving benefit associated with purchasing canned packages. In late 1984, Wilson's group determined that the university's current human resources system was no longer functionally appropriate. After investigating the options, the group decided to install a commercial product: Human Resources from Information Science, Inc. in Montvale, N.J.

Loyola completed installation a little more than a year later, in January 1986. To write a system to do what the packaged system does, "would have taken us approximately 44 person-months, with four full-time employees,"

Loyola University's Wilson

Wilson says. "To install Information Science's package and have it up and running took 15.4 months, with the same four full-time employees."

Even if the initial outlay for a commercial product is greater than apparent development costs, executives may still report cost benefits in purchasing software.

When figuring the economics of developing an accounts-receivable system in-house for one of its 12 divisions, Equifax, Inc. in Atlanta calculated that it could outfit the entire company with a packaged system for the price of writing software for just two divisions. According to Mary Delashmit, director of product systems support, a system from Management Science America, Inc. would run $1.2 million, as opposed to internal development costs of $560,000 per division.

Delashmit sees other advantages as well: "We are provided with support, training and user groups, all of which we'd have to coordinate on our own had we developed in-house."

As a rule

Some companies adopt the policy of purchasing software whenever possible. At North Carolina Baptist Hospital/Bowman Gray School of Medicine, in Winston-Salem, N.C, such a policy has been in place since June 1989, when Ernst & Young put together a strategic IS plan for the hospital.

According to Bob Peddycord, director of systems programming, a survey conducted by Ernst & Young found that the hospital's users had a good feeling for packages. In fact, four of the hospital's major systems, including patient billing and accounting, had been purchased from the outside.

"Given the magnitude of the patient accounting system, had we replaced it with something developed in-house, it would have taken us several years rather than the one [year] it will take us," Peddycord explains. Even in terms of personnel expenses, he adds, in-house development costs would have far exceeded the cost to install purchased software, "so it's time and money saved."

North Carolina Baptist Hospital's Peddycord

Other gains from commercial software may include better integration of data, additional project management functionality and reduced redundancy, all of which have benefited Norwest Technical Services, a subsidiary of Norwest Corp. in Minneapolis.

According to Rob Prigge, a senior systems consultant at Norwest achieved these results by replacing separate in-house budget, time-reporting and project-status systems with Multitrak, an integrated package from Multitrak Software Development Corp. in Boston. Previously, the three systems did not communicate among themselves, which meant less functionality and more repetition of data.

"We have realized short-term cost savings from having an integrated source of project management and reporting," Prigge says. "This way, we won't waste a manager's time with pulling all kinds of information from different systems and then reloading it depending on what format be requires."

Still, implementing packages can be problematic, especially if more than one vendor's products are in use. At Equifax, interfacing MSA's General Ledger with the Accounts Payable system from Integral Systems, Inc. in Walnut Creek, Calif., was perplexing, specifically for journal entries.

However, with assistance from the vendor, building a new module for the interface solved the problem. "It's not a major stumbling block," Delashmit says. "With the vendor's help, it took us a couple of weeks to develop and install the modification. So the cost savings far outweighed any adjustments we had to make in order to interface" the two applications.

Norwest's Prigge

Other pitfalls lay on the buying path. Although vendor-provided maintenance and upgrades may be viewed as positives in

Continued on page 70

Kay is a Tampa, Fla.-based free-lance writer specializing in emerging technologies and human resources.

Concerns spur pursuit of a golden lease

BY LARRY STEVENS

As IS managers search for ways to acquire capital equipment in the face of diminishing budgets, they are looking at leasing with a sharper eye. This is not to say that the use of leasing has increased. Rather, users are learning the numbers in order to scrutinize lessors' offerings and secure the best deals.

"We're doing just as much leasing as ever," says Johnny R. Stafford, vice-president of Central Computer, Inc., a bank service bureau in Victoria, Texas. "We're just more careful; there are more competitors" among lessors.

Frank Gens, vice-president of technology assessment at Framingham, Mass.-based Technology Investment Strategies Corp., pegs corporations' rate of investment in leased equipment at a steady 60% of capital equipment acquisitions during the last five years.

Mark Specker, a senior research analyst at Gartner Group, Inc. in Stamford, Conn., also predicts a steady level of leasing. However, the equipment that users are leasing is changing. Specker says users are signing more contracts for smaller equipment, such as PCs. Currently, he estimates, large systems are experiencing a rate of 60% to 70%, midranges a growth of 35% to 40% and PCs a rate of 20% to 30%. The PCs are experiencing the fastest growth rate, although his estimates do not reflect a major portion of the market.

Specker considers leasing neither good nor bad in terms of cost-effectiveness. When a company is risk-adverse, he explains, it does not want to buy major equipment that isn't a sure thing. It prefers to pass the risk to a leasing firm and doesn't mind paying for that protection. "They're stretching the dollar somewhat, but in the end, they are going to end up paying more," he adds. But "if a firm knows it will need this equipment for a long time, then it's not to a user's advantage to lease."

Pepsico's Dean

Some of the pros and cons of leasing are as neat and clear-cut as a ledger pad. To its credit, leasing allows 100% financing, thus freeing up cash for purchases of other equipment. Lease payments provide more uniform tax deductions than does depreciation. Lack of a large capital outlay may be more pleasing to stockholders.

On the debit side of the ledger, leasing can't provide many benefits that buying can. For instance, purchasing increases the equity base of the company. Purchases usually garner higher tax write-offs in the early years. Finance costs of the purchase price, which may be raised through creative means such as issuing bonds, may be lower than the tariffs exacted by the leasing company.

Most large firms have developed models into which they can feed depreciation schedules, tax rates, lease costs, interest percentages and other figures to come up with bottom-line charts and tables comparing the cost of leasing vs. purchasing. But the final analysis requires some guesses about the future that aren't so clear.

The most important of these forecasts is the residual value, the resale value of the equipment after the lease expires or after the equipment's useful life to the corporation ends.

William Dean, director of technology management services at Pepsico, Inc. in Purchase, N.Y., says that his company has developed a model that allows him to compare the relative advantages of leasing and purchasing by analyzing a wide range of factors, including departmental budgets and the overall financial requirements of the corporation.

The residual value, an important component of Dean's model, requires a study of forces beyond the control of Pepsico and is therefore the most difficult value to determine. "I'd give a

Continued on page 70

Stevens is a free-lance writer based in Springfield, Mass.

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Lease

CONTINUED FROM PAGE 67

million dollars for the crystal ball that says what equipment will be worth in three to five years," Dean says.

Lacking a fortune-teller, many lessees often subscribe to several services that rate residual values, Stafford notes. He does not subscribe himself, but he sees these forecasts not only as a means to gauge whether or not to buy equipment outright but also as a bargaining chip with lessors.

Stafford compares shopping for a system with shopping for a car. "When you go to trade in your car," he points out, "you take out your blue book, the salesman takes out his, and then you start bargaining. But if the salesman is the only one with the book, you're at his mercy."

At first blush, then, it might seem that because all lessors use similar residual value projections, there should be little variation in leasing costs from vendor to vendor. There are, however, situations in which a particular lessor may be able to cut a better deal.

One such situation is when a lessor focuses its business on a particular type of used equipment; for example, IBM mid-range machines. Since this lessor deals directly with user companies and not resale distributors, it can realize a retail rather than wholesale price for the used equipment. This raises the residual value to the lessor, who then can lower the lease cost.

Another instance is when the computer vendor, such as IBM, is also the lessor. In such a case, the vendor may be willing to sacrifice some of its profit from leasing in return for the sale of equipment.

Whether or not a leasing company falls into either of these two categories, Pepsico's Dean advises IS managers to encourage strong competition among lease vendors. He says that Pepsico will not sign a deal until it has considered at least three competitive bids.

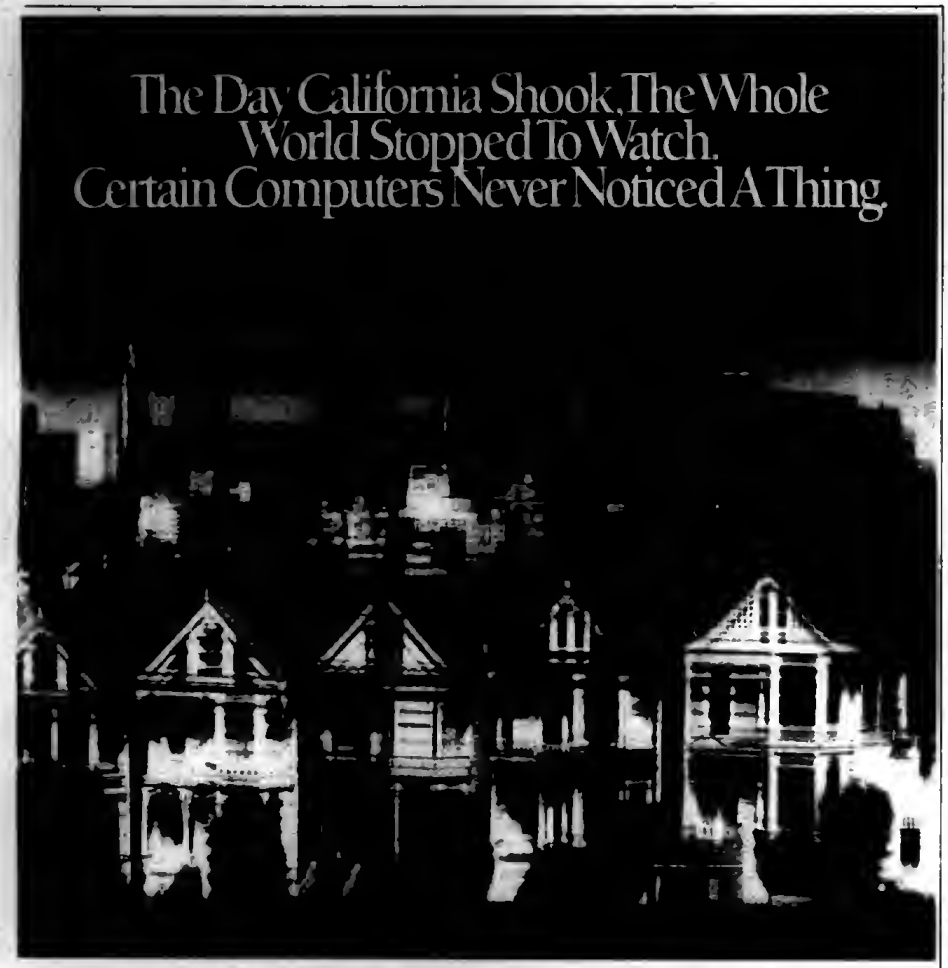
Stafford notes competition among lessors has increased dramatically in the last 10 years and that be, too, is exercising more caution in choosing one. He says that a few years ago, his firm might simply call a lessor and take whatever figure was offered. Now be may review four or five different quotes. Competition has also brought rates down. "We took rates five, six, seven years ago that we would laugh at today," Stafford adds.

Educated guesses

Although comparing the pros and cons of leasing is not an exact science, IS has come a long way toward making its guesses more educated.

"The lessee community has become more sophisticated," Stafford says.

However, since lessors have become so competitive and users informed enough to ask, Stafford says, "lease companies have opened their books. We're all working with the same figures, and we have a better chance of making the best decision for our company." ●



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Store-bought

CONTINUED FROM PAGE 67

purchasing software, they can also be construed as negatives. Since both functions are at the discretion of the vendor, if a user company changes its operating procedures the canned software may no longer be suitable if the vendor cannot provide for those new needs.

Of course, a user may not be able to find a suitable commercial product in the first place. The narrower the scope of a business or an application, the less likely a company will be able to identify an outside offering that fits its needs. In-house development, then, is far from extinct.

Still a need for in-house work

"No one knows a company or its operations as well as the requestor or the data processing services provider," observes Chuck Newton, president of Newton-Evans Research Co. in Ellicott City, Md. This is why, Newton concludes, companies will continue to develop in-house systems at a total cost of nearly $11 billion in 1990.

Newton reminds IS executives that in-house development may mean a longer lead time before the system is in full production — if ever. In-house projects, be says, fall prey to endless tweaking by IS employees, who just don't seem to want to let go. "You can go anywhere in the country where development is done by MIS, and you'll always hear, 'Yes, the system is 90% completed, but we'd still like to do this and this,' " Newton says.

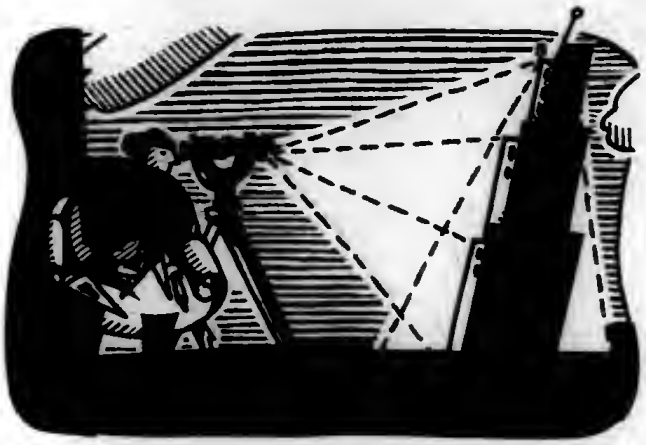
Advances in technology will help to improve that process. For instance, developing systems using computer-aided software engineering (CASE) saves time and money and, in many instances, produces a superior end result. CASE, however, will also benefit commercial development efforts, driving down costs that could be reflected in lower package prices. "It will be interesting to see who adopts this approach most emphatically, first — the vendors or corporate MIS," says North Carolina Baptist Hospital's Peddycord.

McNee at Gartner Group concurs. In addition to CASE tools, the advent of relational database technology, SQL and open systems simplify applications development in-house. "In the mainframe world, proprietary is dead," McNee says. He predicts an accelerated trend toward buying "applications shells" — packages that will sit on top of these open environments and allow the corporation to customize the system according to its own specific needs. ●

Survey your way

How to map IS performance with a thorough organizational study

BY IRV BROWNSTEIN



Normand Cousineau

Information systems managers today have it easy. All they have to do is use IS for competitive advantage. And help re-engineer business processes. And develop long-term strategic plans. And educate senior management about IS. And institute cross-functional systems. And become more efficient. And accomplish this with budgets that in many cases have smaller increases than those of the previous year. Easy.

How prepared is your IS organization to handle this awesome mix of goals? For that matter, do you know how effective your IS department is today?

A recent *Computerworld* poll found that 75% of chief executive officers and chief information officers believe that IS performance and efficiency can be effectively measured. Do you agree? We're not talking about how many personal computers or mainframes you have, but answers to harder questions: What kind of code do you have, and how old is it? What sort of staff do you have, and how well suited are they for the work? How well do they work? Are the processes efficient? Is the staff overloaded?

Speaking of work, how punctual are you with delivery commitments? Are your business customers satisfied? Are your systems products of high quality? Who says so?

And all that maintenance. Is it efficient? How much code is being handled per person? How much code can one person handle? Do you have the right kind of staff? Where are the "hot spots" that consume most efforts? Do you know what code to convert, rewrite or leave alone? In what priority? And just how well does maintenance efficiency compare with development work?

You probably have a lot of tools, but do you know whether they're the right ones? Or if anybody is using them? And are they using them in the intended ways?

For that matter, how does all this compare with last year? Are you improving? And what about other companies? How do you stack up?

Tough questions, made even tougher because there is a surprisingly small body of work in the industry that defines and sets standards for IS organizations seeking to do a complete self-survey. While several groups have established limited surveys targeting elements of effectiveness and efficiency, no one has yet advanced one that combines a broad set of measures that can be compared industrywide with a benchmark or baseline data.

Historically, IS has downplayed or neglected programs that measure internal quality or productivity. Many still view such an examination defensively or react with a "we're unique and can't be measured" attitude rooted in the view of IS as art. Some measure only what they're good at, and others simply doubt the quality or consistency of data collected. Too bad.

A well-conducted IS survey gives an accurate snapshot of what's happening today, a way to examine yesterday's trends and a valuable planning tool for tomorrow. The value of such a survey should be self-evident. As Lord Kelvin said long ago: ***"When you can measure what you are speaking about and express it in numbers, you know something about it; but when you cannot measure and when you cannot express it in numbers, your knowledge is of a meager and unsatisfactory kind. . . ."***

If you are a manager of an IS function, shouldn't you know about your organization

Brownstein is president of The Productivity Group Inc., a Franklin Lakes, N.J., consultancy specializing in productivity and quality assurance. He is also affiliated with The Rubin Survey Company, Inc.

• Good information is essential for planning

• Snapshots of yesterday, today and tomorrow

• How well are you doing, anyway?

— in *quantifiable* terms? After all, production center managers can tell you the productivity and quality levels of their widget production for any given year. Why can't the IS group make assessments such as these? The answer is that, in fact, it can.

Conducting an IS survey has many benefits. The survey focuses on highlighting productivity trends by analyzing productivity and quality. This in turn reveals opportunities for improvement. A good survey helps answer key questions such as the following:

- Do we have the right tools for the 1990s?
- Are we measuring the right things? Are they relevant?
- How does our software environment compare with that of others?
- How effective are our delivery mechanisms?
- How does the quality of our processes rate?
- Do we have the information needed to make intelligent, informed decisions about productivity and quality strategies?

What to survey

A good IS survey collects information in four broad areas: organizational demographics, technical environment, productivity data and quality data (see story this page).

Looking at these key areas will help you spot current and continuing areas of emphasis, new trends, trouble spots and new indicators of productivity and quality.

Some organizations, daunted by this seemingly huge task, opt to start small. They first survey development tools as well as development and maintenance efficiency and effectiveness.

While this approach can help an organization get up and running quickly, it deprives them of valuable demographic data — technical platforms and environments — that can help them see the big picture in the right context.

The better your organization is at collecting data about day-to-day. activities, the easier the IS survey will be. Companies with many internal collection mechanisms, project management tools and databases, postimplementation reviews and other automated planning and tracking processes will do well.

One example of data collection is an automated time reporting system. The surveyor's job is simply to siphon off relevant information for a given period of time. Thus, in the best cases, little special effort is needed. For maximum effectiveness, survey results must be strongly oriented to graphical devices with a minimum of text and explanation.

How long the survey takes obviously depends a great deal on the individual organization. First-time surveyors will need more time than veterans. Project length depends on the size of the portfolio, number of employees and many other variables. Once information is gathered, sorting it can take a full-time coordinator a month or so. As a rough guideline, doing a survey can take between two to six months and much longer for very large organizations.

The payoffs

Planning is among the chief beneficiaries of surveying. For example, if you find that your software development tool set is inadequate, you can upgrade and put the right tools in the right area. This gives you maximum efficiency and effectiveness.

Conversely, the process can help you get rid of unnecessary tools or those with a limited payoff. This is particularly helpful for those times when management asks: "Am I getting enough bang-per-buck for all the toys you IS guys are buying?" Knowing such information is also a great help in estimating future projects.

Efficient product delivery is another big payoff of a good survey. Information gained can help you ensure that you are delivering products in the most efficient way. It also lets you look at how the processes themselves are working. Unsuccessful processes can be eliminated, successful ones can be repeated in other parts of the organization. The net result is that you can eliminate or reduce bottlenecks.

Annual budgeting also profits. It's hard to make judgments about what to buy in the coming year if you don't know where your organization is headed or how it is doing. Should you buy more tools? Take on more large projects? Are you efficient at maintaining package software or developing customized applications? A survey can also help you pinpoint maintenance system hot spots.

Staff dispersing

Staffing can also be done more effectively. For example, survey data can help you see if too many high-priced people are working on one project, too many junior or senior people are clustered together or you should have a rotation plan.

Competitive position will also improve. Management always wants to know how your group is doing against the competition. Ford Motor Co. wants to know how it's doing against General Motors Corp. and Toyota Motors Corp; not just in sales, but in terms of IS delivery. "Are we delivering better and faster than our competitors?" they ask. "How does our IS spending stack up against theirs?" Everybody wants to know how they are doing compared with the industry leader.

By comparing your profile with that of other companies, it is possible to gauge IS' competitive position. At present, there are few public sources of benchmark data. The International Function Point User Group in Westerville, Ohio, is preparing comparative information for release in October.

Private consulting firms such as Index Group, Inc. in Cambridge, Mass., and Howard Rubin Associates in Pound Ridge, N.Y., also offer this information for a fee.

As IS evolves and is asked to do more with the same or smaller budgets, careful analysis and introspection is crucial. The IS survey can play a big role in helping IS measure how it is doing — both against itself and its competitors. •

A GOOD IS SURVEY collects information in four broad areas: organizational demographics, technical environment, productivity and quality data.

The complete IS survey

Organizations wanting to conduct a comprehensive information systems audit should zero in on specifics in four areas: organizational demographics, technical environment, productivity and quality.

- **Organizational demographics.**

Topics within the environmental assessment provide a demographic backdrop for specific productivity trends.

Budget. Total IS budget, development budget, support budget, operations budget.

Portfolio diversity. Language distribution, application focus, technical environment, age of code, code structure, application size.

Project dimensions. Project size and duration.

Staff deployment. Staff size, availability, deployment, head counts, contractors, average experience.

Delivered project characteristics. Duration, effort, staffing profile — including peak staff and function points.

Life-cycle distribution. Effort, duration, benchmark deviation.

Training and education. Indicative of the workers' effectiveness.

Work environment. Office space.

- **Technical environment.**

Tool and technique inventory. Analysis, design, code, unit test, system test, installation, maintenance, project management and support tools.

Organizational penetration. Extent of tool use by appropriate staff for all applicable situations.

Process maturity level. Assessment of systematic processes and procedures.

- **Productivity.**

Development efficiency. Language, tools and techniques used, number of function points or source lines of code delivered, total effort, elapsed time, project cost.

Maintenance efficiency profile. Age of systems, quality of code delivered, system "churn rate" (for example, lines of code added/deleted), volume of code supported per person, number and type of work requests, effort/time per request.

Distribution of maintenance work types (for example, corrective, adaptive, perfective, support) staff distribution, distribution of nonmanagers to managers, level of systems familiarity.

- **Quality.**

Key business users' perceptions. Current vs. required level of data accuracy, results delivery, data currency, data security, systems reliability, ease of use, user documentation, report content and quality and adequacy of business support.

Technical quality of application systems delivered. Key developers' perceptions of design, maintainability and operability of each system.

Customer satisfaction with the IS organization. Users' evaluation of the quality of information systems services delivered.

Production problem rates. Number of incidents, focusing on user and systems.

Ability to meet delivery commitments. Degree to which project delivery commitments during current year were met, reasonable tolerance of approved time/budget commitments.

IRV BROWNSTEIN

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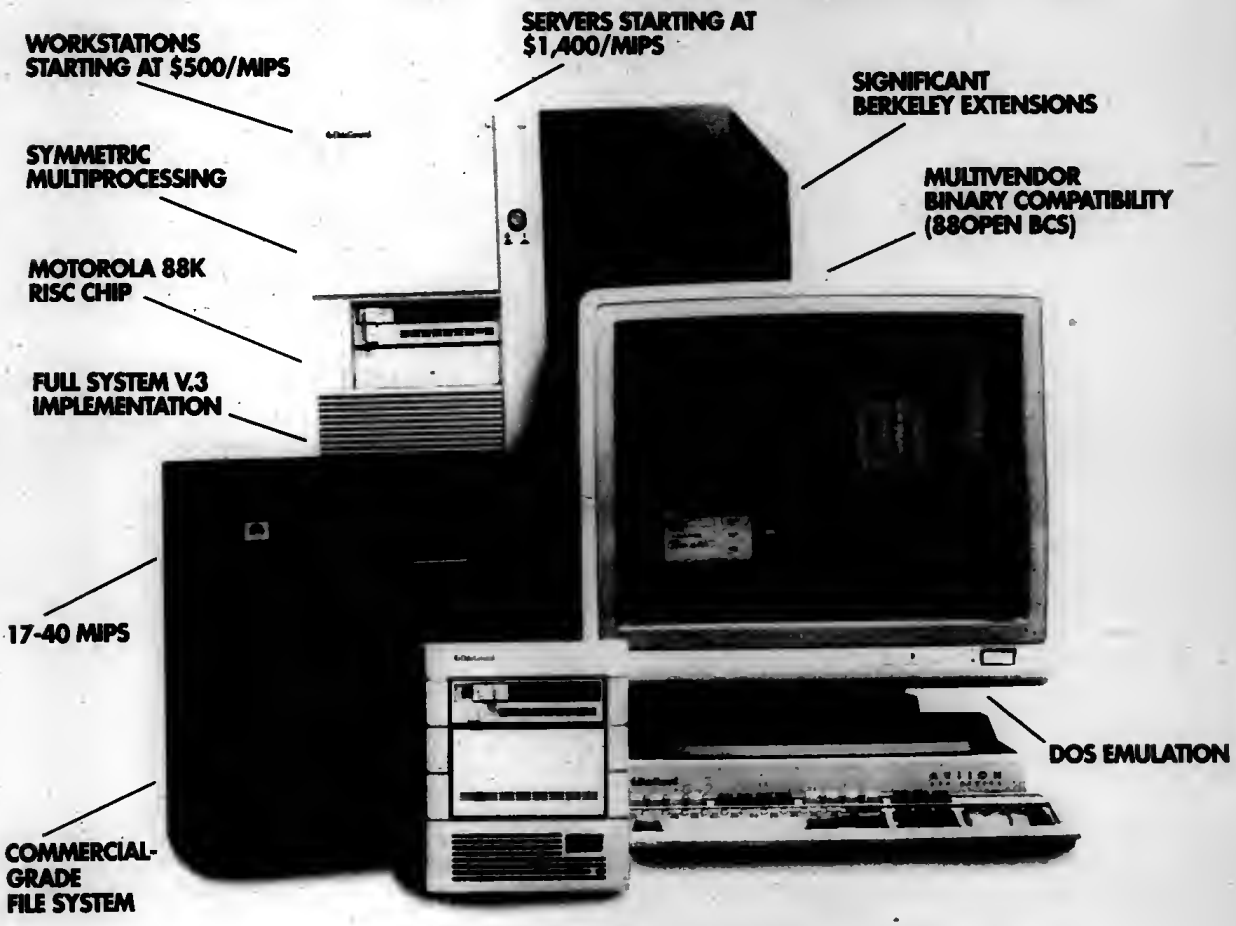

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INDUSTRY INSIGHT

Nell Margolis

Making good lemonade

Ever heard of the great corporate consultant Frank Asch? Chances are you haven't. On the other hand, chances are that your nearest 5-year-old — child, grandchild, niece, nephew, neighbor or what-have-you — has.

If you're over five, you've probably overlooked Asch. However, he hasn't overlooked you. Roughly two out of every three computer company announcements that I've seen during the past year boil down to what Frank Asch told me a decade ago when I read his book *Good Lemonade* to my toddler. This fellow, now masquerading as a children's book author/illustrator, knows business like nobody's business.

Asch isn't yet sharing shelf space with Michael Hammer and Warren McFarlan, but he ought to be arriving there any day now — at least, according to what I've been seeing on *The New York Times* Non-Fiction Best Seller list. That's the list where a slim volume called *All I Really Need To Know I Learned In Kindergarten* has been hanging on to top five status for 68 weeks — a couple score or more of them as the No. 1 entry. Now it's down to fifth place on the hardback list, but the paperback best seller list has picked up its top-slot option.

I personally haven't read it. I don't have to. I need only read the title to know that the book is dead-center accurate. Think about it: Putting aside facts, what of any importance do you know now that you didn't have a real good grip on around the time you were learning to add? (Note, please, that no one is contending that your grip remained firm in the intervening years — only that you had it then. By thirtysomething, most of us are either hiring — if not hiring out as — consultants; at fivesomething, though, we darn well knew . . .)

Good Lemonade is a shining example of the wisdom of *Everything I Needed To Know* as applied to the business sector — by no means limited to, but promi-

Continued on page 80

Storage Tek faces turbulence

Popular tape library does not necessarily ensure smooth sailing ahead

BY RICHARD PASTORE
CW STAFF

LOUISVILLE, Colo. — With eight straight profitable quarters in its wake, Storage Technology Corp. has clearly left its financial woes behind. However, some analysts are concerned that with one product — the popular automated tape library system — providing most of the wind for its sails, the firm may find rough waters ahead in the increasingly crowded storage market.

The Storage Tek tape library, which robotically stores and retrieves up to 6,000 cartridges, has been powering the company since it was introduced two years ago, according to analysts. Approximately 1,100 of the $500,000 systems have been sold in that time.

However, some fear Storage Tek may be too dependent on this single product, especially in light of growing competition. Memorex Telex is now reselling a Fujitsu Ltd. library in the U.S., and IBM is rumored to be testing an OEM library for possible reselling [CW, Feb. 19].

President and Chief Executive Officer Ryal Poppa acknowledged that his library "is the engine pulling the train." However, he noted, "the rest of the train has power, too."

Storage Tek is not a one-product company, Poppa said. If there were a slowdown in library sales, he said, the company would continue to perform quite well, if not *as* well.

Poppa said he is not concerned by current competitors' library systems. "In every case where customers have evaluated them against our library, we have won," he claimed.

According to Poppa, the system IBM is rumored to be considering — built by West German manufacturer Haushahn — is slow and inferior overall to Storage Tek's offering. But he acknowledged that his firm would inevitably lose potential sales to IBM. "IBM, because of its great marketing power, could sell Edsels," he said. IBM would not divulge any plans to sell a tape library system.

Even if it were faced with a

Ryal Poppa says *his library 'is the engine pulling the train'*

quality IBM library, Storage Tek would still have advantages. "They have a tremendous jump on that market right now. IBM would be coming in very late in the product cycle," said Byron Walker, an analyst at Moody's Investor Service in New York.

In addition, an IBM entry into the tape library market would reverse a disparaging stance that IBM has maintained for years, according to Poppa. "I pray that IBM will announce a library because they will endorse the concept," he said.

Perhaps in anticipation of an answer to his prayers, Poppa is not resting on his library laurels. The firm plans to roll out smaller, faster libraries and larger, slower versions in the next two to three years, he said.

In the meantime, the company's development emphasis is on a family of disk drives code-named "Iceberg." Poppa is hoping the drives, slated for mid-to-late 1991 delivery and featuring fault-tolerant capabilities, will one-up IBM's 3390 drive.

Fault-tolerant drives would differentiate Storage Tek's products from the competition, something it has yet to do, according to Casey Stern, an analyst at Altman Brenner Wasserman & Co. in New York. "IBM is working on one, but it's probably three or four years away," Stern said.

However, analysts, concerned that the library boom cannot last forever, are worried that Storage Tek will suffer if Iceberg is late to market. "If they screw up on Iceberg or somebody comes out with something like it in the next quarter or two, that will hurt them," Walker said.

Poppa himself is worried about keeping his disk drive customer base loyal and patient during the next 18 months before Iceberg is due to ship.

"We will clearly lose some percent of market share during this period," he said. "But we want to make sure the world knows we're going to stay in the DASD business."

One user who is willing to wait is George Banta, IS manager at ITT Corp.'s aerospace optical division in Fort Wayne, Ind. But Banta said he is not sure how he would react if the drives were delayed significantly beyond 18 months.

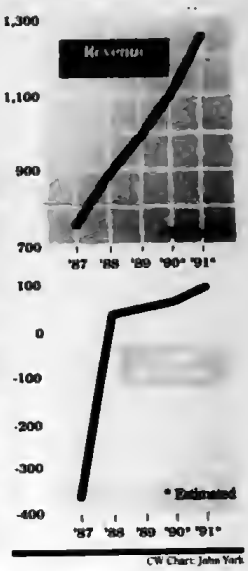
If anyone can convince customers to wait, Poppa can, several analysts said. A visionary according to their accounts, he joined the firm while it was under Chapter 11 protection and recognized the importance of developing the tape library.

"Under very difficult circumstances, Ryal convinced people to continue funding its development while they were in bankruptcy," Walker said. The move paid off in a big way: "In retrospect, the company wouldn't exist without that product."

Users also respect Poppa's accomplishments. "I have a lot of confidence in him," Banta said. "I've stayed with them throughout the bankruptcy and now the company's very sound."

Looking good, for now

Revenues and profits have yet to suffer a relapse, but increasing competition will be the real test for Storage Technology



CW Chart: John York

Leasing companies suffer pinpricks

BY NELL MARGOLIS
CW STAFF

Depending on what niche you're peering into, the overall U.S. industrial slump is anywhere from an irritant to a catastrophe. For publicly traded computer leasing companies, it is enough to knock their stocks off.

Computer leasing stocks are not being undercut by a single sword, said Thomas Donovan, director of financial strategies at Technology Investment Strategies Corp. in Framingham, Mass.

Rather, he noted, they are suffering the torture of a million pinpricks. The following list of reasons to shy away from investment in computer leasing firms is varied enough to offer something for almost everyone in the motliest of investor crews:

- A disappointing second quarter earnings report from computer leasing firm Capital Associates, Inc. earlier this month, Donovan said, no doubt triggered a mini-flight from leasing stocks at large. Capital Associates announced an 81% drop in profit compared with last year's second quarter. As of last week, Capital's stock was trading at 3½ points — its 52-week low.
- The late 1988 crash of Continental Information Systems, Inc. (CIS), then the second-largest U.S. independent computer lessor, continues to be a source of ill feeling in the industry, Donovan said. "There's always some new bad news out of there," he said. CIS is currently being evaluated and possibly reconstituted under the protective wing of Chapter 11 of the U.S. Bankruptcy Code.
- Early rumblings of the financial disorders that led to the mid-month bankruptcy filing by investment syndicator Integrated Resources, Inc. and the next day's announcement that real estate investment giant VMS Realty Partners was suspending payments to its lenders and publicly traded funds probably also soured investment in computer leasing companies, Donovan said.

Both firms have computers in their portfolios, he said, noting that even though the connection is tangential, fear is contagious in the extreme. "There's a lot of negative news around," he said. "When someone sees a market like real estate syndication fall-

Continued on page 85

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Margolis

FROM PAGE 77

nently including, the computer industry.

I ventured this theory a couple of weeks ago over breakfast with the chief executive officer of a multinational computer company. An avid reader of business-oriented media, he nonetheless hadn't heard of Asch and was skeptical. One of the beauties of a book that has big print, bigger illustrations and fewer than thirty pages is that you can virtually recite the whole thing in the time it takes someone to polish off a croissant. I did.

Asch's book details the rise and fall and comeback of an entrepreneur, grade-school style. When Hank first opens his lemonade stand on a sunny summer day (note, please, his innate sense of timing, location and market), it attracts every kid and pet from blocks around. After the curiosity factor has run its course, however, business drops off sharply. Why? asks a bewildered Hank. What do they want that I haven't got? His friend Howie tells him: good lemonade.

Easy, right? Wrong. Poor Hank bungles onward with lack of wisdom beyond his years. He ups his ad budget, plastering the neighborhood with posters. When that fails, he slashes his prices. He structures special deals. The customers continue to stay away in droves.

One day, while puzzling out the latest surefire strategy, Hank notices kids queueing up for — what? Something that must be pretty neat to draw such a crowd a block or so away. The mini-marketeer abandons his business planning long enough to go check it out. What he discovers is nothing short of appalling: the competition has arrived, and is wolfing down market share!

What's your secret? Hank asks the owner of Howie's Lemonade Stand. Howie tells him: good lemonade.

Before I even got to the happy ending where Hank and Howie partner up as successful lemonade purveyors, the computer company chief was hooked. "Where can I get the rights to that book?" he asked, punctuating the air with the tail of his croissant. "I want to blow it up to poster-size and hang it where no one in our company can fail to see it." When last seen, he was planning to get in touch with Frank Asch to secure the relevant permissions. He was also talking about the possibility of promoting Asch's work to Harvard Business School as text for a case study.

I haven't seen him since, so I don't know how far he got with either plan. My best guess is that if the CEO follows through, Asch will say yes and the B-School will say thanks, but no thanks. In the business school context, a book that reminds students that all they need to know about business they've already learned in kindergarten could be viewed as nothing short of subversive.

Margolis is *Computerworld's* senior editor, industry.

ON APRIL 27, SOME OF THE BRIGHTEST MINDS IN THE COMPUTER INDUSTRY ARE GOING TO GET FIRED.

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IN BRIEF

United we stand I

Advanced Micro Devices, Inc. and Sony Corp. subsidiary Sony USA are teaming up to take on the semiconductor market. A technology transfer agreement announced last week will seed a Sony advanced submicron integrated circuit manufacturing operation in a now-idle portion of a Texas-based Advanced Micro plant. The pleased new partners predicted gains all-around: for Sony, a quick ramp-up as a domestic U.S. semiconductor producer; for Advanced Micro, Sony know-how and $55 million cash for the plant.

United we stand II

El Cerrito, Calif.-based Earnest Computing, Inc. is trying to get the preferential pricing treatment available to larger firms by forming a consortium of small companies interested in purchasing large quantities of Intel Corp. chips. Although Intel does not sell directly to any purchasing consortiums, an Intel spokeswoman said the Santa Clara, Calif. firm would not rule it out.

Dan'l Boon

Dan'l Lewin has resigned as vice-president of sales at Next, Inc. and is about to begin as vice-president of sales and marketing at Foster City, Calif.-based Go Corp. His former post at the Jobs shop will be manned by Todd Rulon-Miller, who moves up from the position of director of sales at the Redwood City, Calif.-based Next.

No sale

As of mid-February, the move to sell The Ultimate Corp. is off, according to company chairman Michael O'Donnell. The report of an independent committee that was formed to consider all financial options open to the struggling software company in the wake of a takeover bid last fall, O'Donnell said, convinced the board that the better alternative lies in shaping the company up rather than shipping it out.

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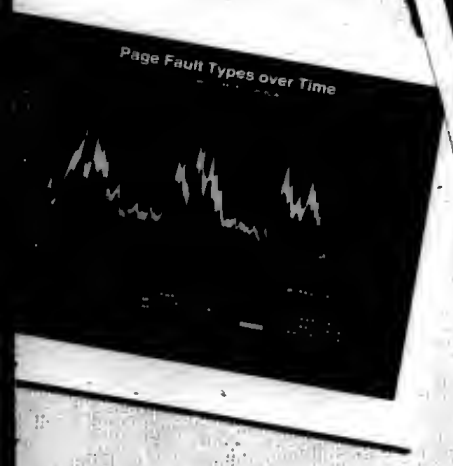

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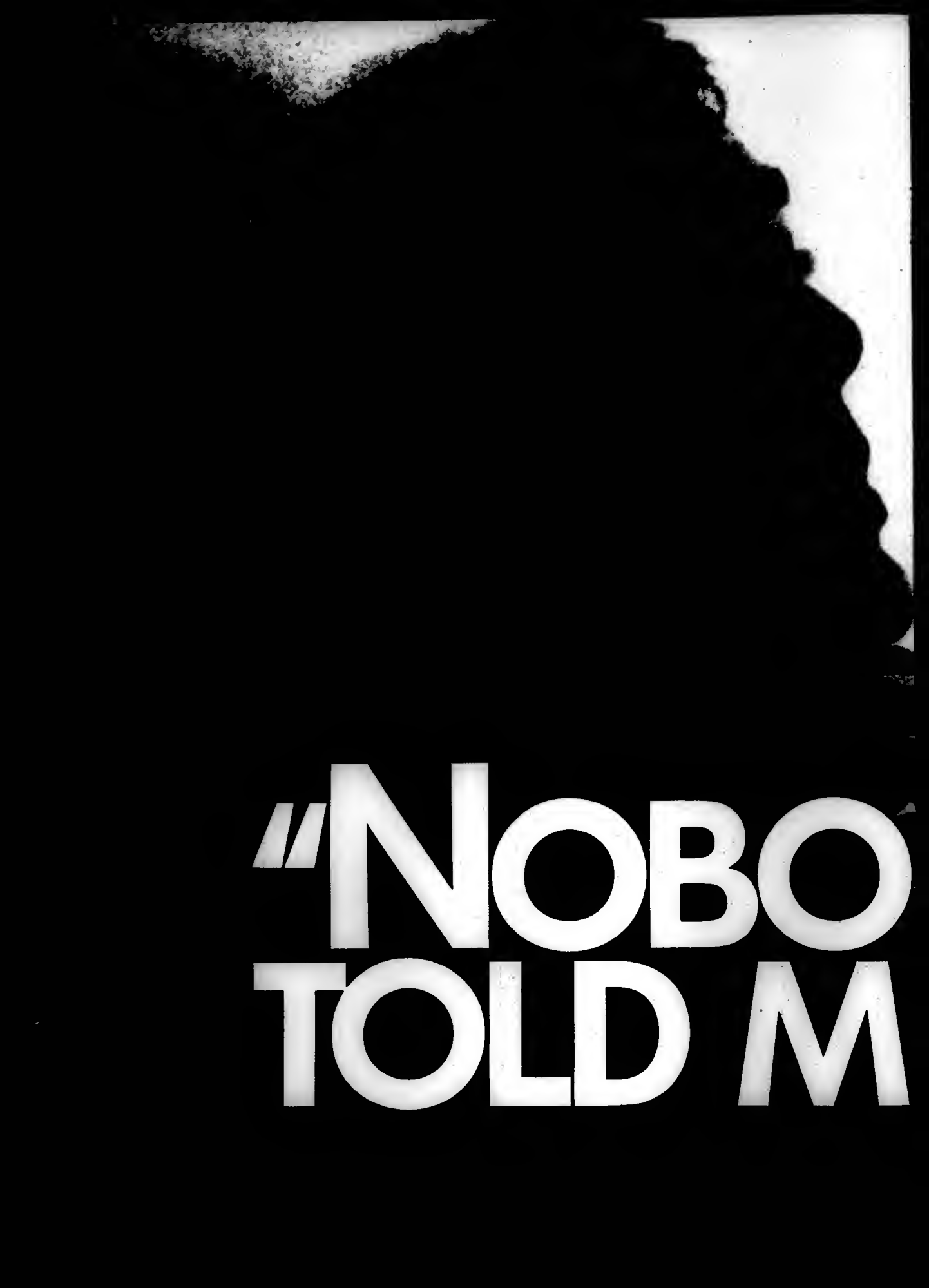
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MOTOROLA

Verity plots revolution in desktop text retrieval

BY JEAN S. BOZMAN
CW STAFF

MOUNTAIN VIEW, Calif. — Text retrieval used to require two things at most user sites: a large mainframe and a helpful librarian to guide users through the text indexing system. But Verity, a two-year-old Silicon Valley startup, is planning to put the user in control on both of these scores with its Topic database system, which stores and retrieves both text and images.

"We looked at the market from the point of view of bringing text retrieval to the desktop," said Verity Chief Executive Officer Michael Pliner, who was chairman of Sytek, Inc. before it was sold to Hughes LAN Systems in 1987. "We do a lot of processing on the client side of client/server architecture." That means quicker response time, since documents can be stored closer to the user. Until the advent of client/server architecture, high memory costs had prevented distributed handling of corporate documents, according to Pliner.

Verity's Pliner wants to bring text and image retrieval to the user's desktop

Verity, which was founded as a spin-off from Advanced Decision Systems (ADS) in April 1988, has had two rounds of venture financing totaling $9 million. With a current complement of about 50 employees, its executives said, the company is not eyeing a public market entry in the near future.

At this stage of its strategy, executives are concentrating on speaking with prospective clients and porting Topic to new platforms, including the Apple Computer, Inc. Macintosh. The firm wants to build up a user base in Europe while simultaneously seeding the U.S. market, according to Pliner.

In doing so, young Verity is taking on several well-established firms, including Information Dimensions, Inc. in Columbus, Ohio, which makes the Basys retrieval product, and Data Retrieval, Inc. in Milwaukee, Wis., which sells IBM-based retrieval software.

Instead of running on bulky mainframes, Topic runs on Digital Equipment Corp. VAXs, Sun Microsystems, Inc. workstations, Unix machines and MS-DOS-based personal computers. Reliance on slimmed-down platforms as servers lowers the entry price for text-retrieval products, according to several industry analysts. Topic software runs from $15,000 to $65,000, depending on the hardware platform used.

Topic's search system, which replaces classic and complex queries with a considerably more accessible user-prompt format, is a rarity within the text-retrieval industry, said Gerald Michalski, director of intelligent document management research at New Science Associates, Inc.'s Mountain View office.

Michalski said that Verity is having some success in lining up large users, particularly within departments or divisions of large corporations. Among these early users are Chase Manhattan Bank in New York, Children's Hospital in Boston and Apple in Cupertino, Calif.

However, like most other text-retrieval firms, Verity does not yet have a large client list. According to widespread belief among industry observers, that is because small and mid-size organizations have had little experience with text-retrieval techniques or fear the large costs associated with older systems. Some early users acknowledged Verity's need to "sell" the Topic concept but voiced faith that the company will grow steadily over the next two years. None who spoke to *Computerworld* were afraid that the small start-up would fail.

The Washington, D.C., law firm of Sutherland, Asbill and Brennan is using Topic on a Novell, Inc.-based corporate local-area network. "Topic fits within the scheme of what we're doing here," said George Ramsey, information systems coordinator at the firm. "It allows us to search the data in different ways, giving our attorneys the ability to browse through legal abstracts by content."

Conventional relational DBMS systems can only search by subject or title, Pliner said. In contrast, he said, Topic's concept-driven menus guide users through subject areas and allow them to set their own "weighting" priorities according to the amount of detail they want to see.

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Toronto, On.	Mar. 20, 21	Long Beach, Ca.	Sep. 29, 30
San Francisco, Ca.	Mar. 26, 27	Tokyo, Japan	Sep. 4, 5
Chicago, Il.	Apr. 11, 12	Sydney, Australia	Sep. 12, 13
Frankfurt, W. Germany	May 2, 3	New York, NY	Oct. 3, 4
Washington, D.C.	May 7, 8	St. Paul, Mi.	Oct. 10, 11
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CONTINUED FROM PAGE 77

ing, it doesn't take long to think, Oh boy, and that's *safe* compared to computer leasing . . ."

However, when it comes to investing in computer leasing firms, several analysts said last week, one particular company's rise creates as large a fear factor as any company's fall. IBM subsidiary IBM Credit Corp.'s (ICC) assets increased 47% to $3 billion between 1988 and 1989. As the IBM captive flourishes, it casts a shadow across the futures of all of its independent competitors.

"Investors are concerned that technology leasing has become much more competitive and that a fight against IBM is going to be a losing battle for most companies," said Robert Sullivan, an analyst at Paine Webber, Inc. "These [computer leasing] stocks have not been good performers for a long time."

Ironically, the ICC factor could be the beacon that lights the road back to robust performance for computer-leasing stocks. With the ICC lesson fresh in their minds and on their balance sheets, leasing companies are racing to diversify their portfolios from computers in general and IBM computers in particular.

Cleveland-based LDI Corp., for instance, has logged compound annual revenue growth of approximately 54% in each of the past five years and maintains an underleveraged balance sheet to boot, noted Elliott L. Schlang, an analyst at regional brokerage firm Prescott, Ball & Turben. "What really impresses me about the company — one of the central reasons for its performance — is the breadth of its portfolio," Schlang said. LDI, he said, deals in equipment across all segments of the computer industry and from a wide selection of vendors. In addition, the company has expanded into telecommunications and medical equipment and provides maintenance and disaster recovery services.

It is a top-down trend: Over the past three quarters, independent computer-leasing market leader Comdisco, Inc. has gone from a virtually all-IBM lease portfolio to approximately 55% non-IBM holdings. The company's plan for the current fiscal year is to increase its volume of leases written by approximately 25% while further reducing IBM's representation.

"So far, they're right on plan," said Peter Labe, an analyst at Labe, Simpson & Co. in New York. Shrinking IBM presence on its bottom line and a major shot of remarketing income in sight as a large number of machines come off lease should hand Comdisco strong third- and fourth-quarter figures, Labe said. "I don't see a lot that could stop it."

NICKELS & DIMES

Informix Corp. reported net income of $2.7 million on revenue of $43.2 million for its fourth quarter ended Dec. 31, 1989, compared with a $2.6 million net loss on $27.9 million in revenue reported for its fourth quarter 1988. For the year ended Dec. 31, 1989, the firm logged a 40% increase to $145 million in revenue and a 338% increase to $6.4 million in net earnings, compared with figures for the corresponding period of last year.

Compaq Computer Corp.'s European sales for its recently closed 1989 fiscal year broke the $1 billion barrier, bringing total international revenue for the firm to $1.3 billion and catapulting Compaq into the No. 2 spot in the European commercial personal computer market, according to market research firm Dataquest Europe.

Honeywell, Inc. posted a $604 million profit for fiscal 1989, compared with a net loss of $435 million reported for the preceding fiscal year. The 1989 results included an after-tax gain from the sale of assets, primarily the $313 million sale of Yamatake-Honeywell shares.

Aldus Corp. reported revenue of $23.7 million for its fourth quarter ended Dec. 31, 1989, up slightly from $23.6 million reported for the corresponding quarter of 1988. Net income for the quarter was $4.6 million, up from $4.3 million thatthe company earned in last year's fourth quarter. For its 1989 fiscal year, Aldus reported net income of $15.5 million on revenue of $87.9 million, up 6% and 11% respectively from net income and revenue reported for fiscal 1988.

Interleaf, Inc. reported a loss of $15.3 million, including a one-time $13.5 million profit drop after a tax restructuring charge, for the third quarter of its 1990 fiscal year ended Dec. 31, 1989. Revenue for the third quarter was $21.5 million, compared with $21.3 million earned during last year's comparable period.

Phoenix Technologies Ltd. reported a net loss of $4.9 million for its first quarter of fiscal 1990, ended Dec. 31, 1989, compared with net income of $2.9 million for the same quarter ended Dec. 31, 1988. Revenue for the quarter was $7.8 million, compared with $14.6 million for the same quarter of fiscal 1989.

Intellicorp, Inc. reported a net profit of $433,000 for the second quarter ended Dec. 31, 1989. This compares with a net profit of $13,000 for the second quarter a year ago. Revenue was $6.1 million, a 20% increase over $5.1 million for the second quarter last year.

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Southfield, Mi.	Mar. 1	Seattle, Wa.	Jul. 12
Omaha, Ne.	Apr. 3	Kansas City, Mo.	Jul. 31
Burlington, Ma.	Apr. 5	St. Louis, Mo.	Aug. 28
Cincinnati, Oh.	Apr. 10	Montreal, PQ	Sep. 4
Somerset, NJ	Apr. 17	Windsor Locks, Ct.	Sep. 11
Rochester, NY	Apr. 24	Durham, NC	Sep. 13
Pittsburgh, Pa.	Jun. 13	Calgary, Ab	Oct. 16
Orlando, Fl.	Jun. 14	Atlanta, Ga.	Oct. 30

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City	Date	City	Date
Long Beach, Ca.	Feb. 14, 15	Scarborough, On.	Sep. 5, 6
New York, NY	Apr. 18, 19	Arlington, Tx.	Sep. 25, 26
Dearborn, Mi.	Jun. 6, 7	Baltimore, Md.	Oct. 17, 18
San Francisco, Ca.	Aug. 1, 2	Chicago, Il.	Oct. 23, 24

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"So, Horvath, what you're saying is graphical word processing is imperative to the future of this corporation. Well?"

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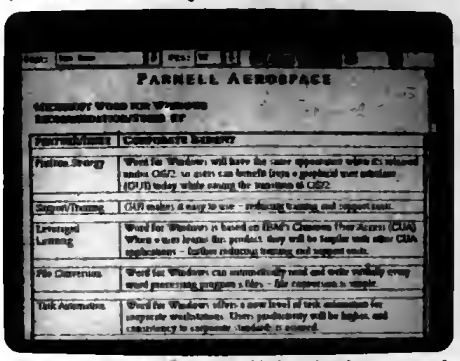
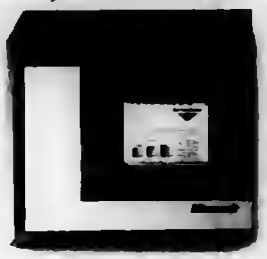
HORVATH: Well, Mr. Parnell... I think now's the time to make the change...
PITZER: Sure, that's what Cundy said about our database program two years ago. And we *all* know what happened to...
PARNELL: Pitzer, let Horvath finish.
HORVATH: Based on my comprehensive evaluation, I'm convinced that Word for Windows is the answer.
PARNELL: Word for *who?*
HORVATH: Windows, from Microsoft.
HAMILTON: Frankly, Ivan, I don't see why we have to change at all.
HORVATH: You're missing the point. Graphical computing will soon be the standard. If we adopt the Windows platform now, all of our users benefit. Heavy users would spend hours on projects instead of days. And light users, minutes instead of hours. The way it stands, we're throwing away a whole lot of money. Not to mention productivity.



Word for Windows' graphical user interface benefits people who've never even seen a boardroom. As well as those who frequent it.

HAMILTON: But what about that OS/2 business everyone's been talking about?
HORVATH: What about it?... The interface will be virtually the same on Windows and Presentation Manager.
FIDLER: C'mon Horvath... that's a little hard to believe.
HORVATH: Not really... you see, Word for Windows is based on IBM's Common User Access. Once our users learn it, they'll be well on their way to understanding other applications that support CUA.
FIDLER: That's all *very* nice, Ivan, but let's go beyond long-term benefits...
HORVATH: Okay, Fidler. Consider how long it takes to develop a standard contract...
FIDLER: Yeah, what about it?
HORVATH: Using Word for Windows would eliminate the problem. Its Document Template feature can prompt users to input necessary data... So even our paralegals could write contracts.
DELMAN: Just a minute, Mr. Parnell, who's gonna provide the training?... It may be my job, but I haven't got time for it!
HORVATH: Relax, Delman... Word for Windows has computer-based training and context-sensitive, on-line help. So it's virtually foolproof... users can train themselves. Which means our training and support costs would be reduced and the corporation saves money.
COHEN: But what about the equity we have in our current system? Are you suggesting we trash it?
HORVATH: Not at all... Word for Windows has complete file conversion facilities...
COHEN: Complete?... *How* complete?
HORVATH: It'll read *and* write to virtually every word processing program.
PARNELL: So let me get this straight, Ivan... you're saying that Word for Windows is easier to use and allows people to do more things?
HORVATH: Precisely.
PARNELL: Which could only improve our productivity...
HORVATH: I rest my case, Mr. Parnell.
PARNELL: Most impressive, Ivan. But before I make my decision, I'd like to hear what Cameron thinks. Cameron?... *Cameron?*
LUCERO: Psssst... *Hey, Cameron, wake up!*



The preceding scenario has been a dramatization. The benefits of Word for Windows, however, are a reality. For further proof of its capabilities, simply call us for a free brochure. Or order our fully-functional Working Model for just $9.95.* The number is (800) 541-1261, ask for the folks in Dept. K56.

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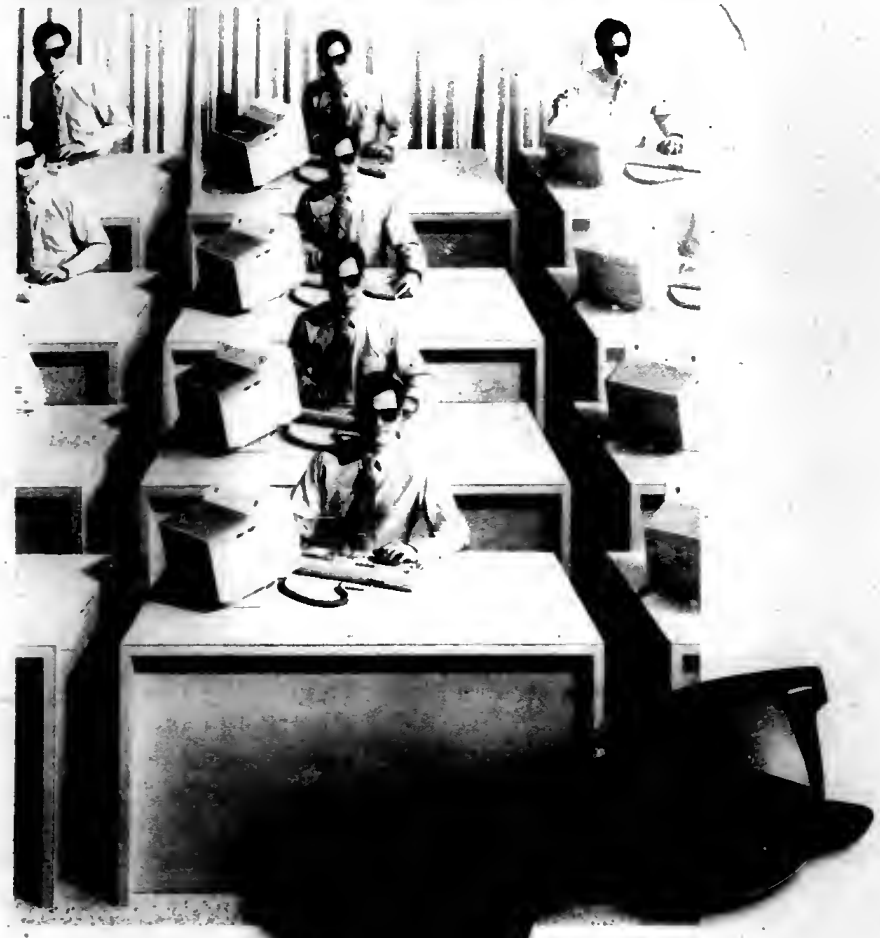

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Facing up to career busters

Be careful! These common career blunders could get you too

BY JANET RUHL
SPECIAL TO CW

For years, many information systems professionals have felt that putting serious effort into long-term career planning is a waste of time. They've been able to violate most of the traditional principles of career planning and still see their salaries grow. In addition, the dizzying speed of technological change has made true, long-term planning almost impossible. But don't think IS professionals don't have to keep alert to avoid career-threatening dangers, particularly in today's era of corporate layoffs, slow growth and a maturing workforce.

One of the biggest mistakes IS professionals can make in planning a career — or failing to do so — is to become overly specialized in the wrong area. This step can cost them further down the road and, in the worst case, leave them unemployable. The problem is that it's usually only with hindsight that one knows what to specialize in.

Programmers who in the early 1980s specialized in one relatively obscure technology, the C language, had no way of knowing their services would command salaries in the range of $100,000 a few years later. But people who mastered similar technologies at the same time, such as the UCSD Pascal system, find that the skill is now almost worthless.

In the mainframe world, IBM put its marketing muscle behind two major new products a few years ago. People who mastered one of them, DB2, now find themselves in great demand and command excellent pay. The failure of the other major introduction, the 9370, left those who committed their energy to mastering it high and dry.

The biggest technological career buster is not specializing in the wrong hardware or software. It is mastering a technology that is unheard of outside of a single company, or at times outside of a single department.

Over the years, many large corporations have developed in-house operating systems, teleprocessing monitors and compilers. New hires impressed by the reputation of the corporation often take jobs in such environments without realizing that the software they are mastering is of no interest to anyone other than their current employer.

After a few years, they discover that other employers only want people experienced with more popular software environments and languages. Even in their own companies, they may find it hard to move into new projects because managers expanding their staff are more interested in people with mainstream experience.

While difficulties arise for people who become gurus in technologies that fall by the wayside, an equally grim fate awaits IS professionals who move into management when their real strengths are technical. It is far easier for a fired programmer to find work than for a discharged middle manager to get a new job. After five years in management, many people find that their technical skills have withered. The technology they worked with has become obsolete and their exposure to new technology is often confined to the paperwork needed to bring it in. Taking a promotion into management is therefore a serious step, because if the new manager doesn't succeed in management, there may be no going back to a more technical path.

Unfortunately, the very skills that help IS professionals succeed as technicians can hurt them as managers. Executives often claim that managers from technical backgrounds delve too deeply into details, encounter trouble delegating work and possess weak communication skills.

Universally, managers from technical backgrounds themselves report that they face difficulty rising beyond the lowest levels of management; their inner-directed personalities leave them unwilling or even unable to engage in the brutal intramural politics that often come into play. The technician-turned-manager who was a better technician than manager is often the first to be let go when layoffs hit. "If only I had stayed a Cobol programmer," laments one laid-off project manager after months of job hunting. "At least I'd be able to find a job."

WHILE DIFFICULTIES ARISE for people who become gurus in technologies that fall by the wayside, an equally grim fate awaits IS professionals who move into management when their real strengths are technical. It is far easier for a fired programmer to find work than for a discharged middle manager to get a new job.

Leave it to employers

Many IS professionals get lulled into a false sense that they are actively planning their career because they believe their employer is working to further it. This illusion is often prompted by an appraisal process in which employees are asked to describe their long-term career goals. Unfortunately, the people conducting the appraisals usually are only a single step further along in their own career planning and may not have enough experience or a broad enough outlook to help much.

Furthermore, the supervisors generally aren't evaluated or rewarded on the basis of the long-term success of their erstwhile protegees, but on how well they complete their own short-term objectives. The promotions and opportunities they provide might be aimed at furthering the company's goals more than the career needs of employees.

IS professionals should take pains to decide what directions they need to pursue and make sure their employers know what they want before they are assigned to their next project.

Ruhl is a consultant and programmer in Connecticut and author of *The Programmer's Survival Guide: Career Strategies for Computer Professionals.*

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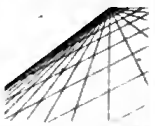

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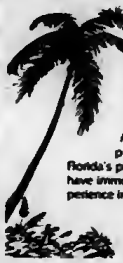

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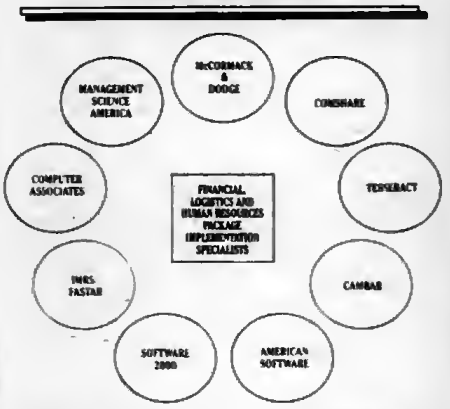

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Employer Fee Paid

Lead Analyst/ Programmer to $39,000

State-of-the-art Midwest shop has immediate opening for a programmer analyst with strong CICS skills Individual will be involved with a wide variety of tasks which include recommending software/hardware solutions, design programs and systems and oversee all phases of system development and implementation If you desire excellent compensation and benefits, call for further details

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Outstanding opportunity exists for a 1-year systems professional that has strong emphasis with MVS systems support along with CICS support skills Assembler programming experience would also be considered a plus If you desire tremendous opportunity and an outstanding benefit package including paid overtime call for further details

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CICS	MVS/Assembler	Oracle/CASE
DB2	w/AFP or Laser	S/38
M&D(IRM)	Printer experience	COBOL
IDMS	AA DCS	PL/I
IMS	MODEL 204	"C"

Please call, Fax or send your resume to
Brenda Pitner

METRO
Information Services, Inc.
5300 W. Cypress St., Ste 285
Tampa, Florida 33607
(813) 289-6955 - FAX (813) 286-1011

SYSTEMS AND PROGRAMMING MANAGER

Valley Systems, the data processing subsidiary of Valley Bancorporation a three billion dollar holding company is looking for a Systems and Programming Manager to help in the migrating from NCR to IBM 3090 MVS/ESA IMS CICS and installing M&I banking software CA-SUPERMICR and MSA financial packages

Qualifications
- Bachelors Degree
- Minimum 12 years in systems development with significant experience in management role
- MVS/IMS and banking software knowledge required

IF INTERESTED SEND RESUMES TO

VALLEY BANCORPORATION
Human Resources Department
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New York State Electric & Gas Corporation, an investor owned utility serving 800,000 customers covering one third of New York State is looking for an IMS Systems Sr. Analyst to work in a 24 hour IMS DB/DC environment. Thorough knowledge of computer science and eight years of related IMS DBA experience is necessary. A four year degree is desirable.

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Recruiting & Employment Administrator
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McDonnell Douglas Systems Integration Company, one of the world's largest computer service companies, is currently in need of data processing professionals with two years Prolog programming experience for an expert systems project in Denver. Gurnus or Arity Prolog and knowledge of AI/ART applications a plus.

We offer a stimulating and challenging working environment and are dedicated to finding candidates with skills as close to the cutting edge as the challenging projects we face.

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It's the efficient way to recruit qualified computer professionals

Now you can target your recruitment advertising to the qualified computer professionals you want to reach - where you want to reach them. All you need is the new IDG Communications Computer Careers Network. Here's how it can work for you:

You choose the newspapers. Depending on who you're looking for, you can select the combination of five newspapers that best suits your needs - **Computerworld, InfoWorld, Network World, Digital News,** and **Federal Computer Week** Editions.

You choose the region. If you wish to recruit within a specific area, you can advertise in the regional editions of the newspapers you choose - East, West, or Midwest. Of course, national buys of individual newspapers or various combinations are also available when you need to extend your reach.

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Sales Offices

John Corrigan, Classified Advertising Director, 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171; 508-879-0700.

BOSTON: 375 Cochituate Road, Box 9171, Framingham, MA 01701-9171, Nancy Percival, Regional Manager; 800-343-6474. (in Massachusetts, 508-879-0700); Andrew Rowe, Account Executive.

NEW YORK: Paramus Plaza I, 140 Route 17 North, Paramus, NJ 07652; Warren Kolber, Regional Manager, 201-967-1350; Jay Novack, Account Executive 800-343-6474.

WASHINGTON, D.C.: 8304 Professional Hill Drive, Fairfax, VA 22031; Katie Kress, Regional Manager, 703-573-4115; Pauline Smith, Account Executive 800-343-6474.

CHICAGO: 10400 West Higgins Road, Suite 300, Rosemont, IL 60018; Patricia Powers, Regional Manager, 312-827-4433; Ellen Casey, Account Executive 800-343-6474.

LOS ANGELES: 18004 Sky Park Circle, Suite 100, Irvine, CA 92714; Barbara Murphy, Regional Manager, 714-250-0164; Chris Glenn, Account Executive, 800-343-6474.

SAN FRANCISCO: 18008 Sky Park Circle, Suite 145, Irvine, CA 92714; Barbara Murphy, Regional Manager, 714-250-0164; Chris Glenn, Account Executive, 800-343-6474.

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2 years minimum professional experience, stable work history, good technical references, U.S. citizenship or green card, and competence in at least one of the following:

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INFORMIX	CLIPPER
CICS	LAN
FOCUS	ADA
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Should you have demanding career goals, the desire to improve your working environment, improve compensation, and learn new skills, call or send resume to:

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We're Mercy Information Systems, a subsidiary of Mercy Health Services and part of the Sisters of Mercy Health Corporation. If you're an experienced information systems professional, consider joining our dynamic consulting and information systems setting.

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Responsible for the operation, coordination and facilitation of regional data centers and divisional information systems plans. Provides guidance on hardware, software and technical enhancements. Develops and implements staff training programs and ensures compliance to budgets and business plans. The incumbent will also manage special projects including vendor evaluations and feasibility studies.

Requires thorough knowledge of hospital operations and industry technology. Strong human relations, management and communications skills.

Vice President Planning and Quality

Responsible for information technology planning and integration with healthcare strategic and operational plans. Will develop and oversee educational standards programs, market research, methods development and "Quality Customer Service" program. Candidate will also design and manage all system implementation projects.

Requires a complete knowledge of the health care field, with an emphasis on information systems technology and its' current and emerging trends. A formal planning background with strong management and human relations skills are a must.

Vice President Product Development and Support

VP will plan, organize, direct and evaluate activities and resources of the division. Develops and oversees business and client service plans, systems and programming services and customer information systems vendors. Ensures timely and cost-effective client services.

Requires a complete knowledge of hospital operations and basic understanding of information systems technology. Strong management, communications, and human relations skills are a must.

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We offer a highly competitive salary and benefits package. For consideration, send your resume to: **Ann Wyszynski, Personnel Services, Mercy Health Services, 34605 Twelve Mile Road, Farmington Hills, MI 48331-3221.** Equal Opportunity Employer.

Business Systems/Quality Control Analyst for Dearborn area Automotive Parts Manufacturer w/ extensive study, analysis, modeling, & evaluation of manufacturing business systems operations, organization, procedures, administration, & software/hardware; apply failure modes & effect analysis to situations; develop strategies for innovation & change in manufacturing operations & procedures w/ improve business systems organization & quality control; present reports to management. 2 yrs. exp. req. in above duties with a B.A. in Systems Analysis. Applicants must have at least two courses addressing the study of basic systems thinking, design, & modeling; & two courses addressing the study of analysis of systems failures & catastrophes, systems modeling approach to organizational decision making, & systems approach w/ organizational change. $30,400/yr. M-F 8AM-5PM. Qualified applicants send resume (NO CALLS) to T. J. O'Keefe, Reference No. 98169, Michigan Employment Security Commission - Department of Labor, 7310 Woodward Ave., Detroit, MI 48202.

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DP

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DBA - DB2 (NC)	$55K
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SA - Mainfrm I (NC)	$50K
PL 6 - Healthcare (DC)	$50K
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PA's - DOS, COBOL, CICS (NC)	$40K
PA 6 - MVS, CICS, Mfg. (NC)	$40K
PA 6 - IMS, Banking (NC)	$40K
SA's 6/38 (DC)	$50K
SA's - LAN (NC)	$45K
SA - ONE (VA)	$40K

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Design and develop computer based analytical models and tools and analyze historical market and sales information for optimizing sales resources allocation. Develop and maintain databases for market potential and individual account information, support annual business plan, business development, etc. M.S. in Marketing/Business. 1+ years experience in personal computer product marketing. Requires academic proportion, research background, development of algorithms for computer based mathematical modeling w/ analysis historical market and sales information and optimize market segments. Academic coursework in quantitative design and modeling of computer based decision support systems, stochastic and analytical models, statistical modeling for multivariate marketing analysis, database management, spreadsheets, computer based statistical packages (SPSS-X, SAS, Data-Desk), and COBOL and Fortran. $45,000/yr., 40hrs./wk. Place of employment and interview: Norwalk, Connecticut. If offered employment, must show legal right to work. Clip ad and send with resume to: Job Order Number 30883321, Job Service Technical Unit, Connecticut Dept. of Labor, 200 Folly Brook Blvd., Wethersfield, CT 06109 not later than March 12, 1990.

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All the information you need is right here. Just call Lisa McGrath at 800-343-6474 (in MA, 508-879-0700). Or, if you want, you can send us the form below via mail or to our FAX machine. You can reach our FAX at ext. 739 or 740 at either of the above numbers.

The following information will help you determine the size ad you'd like to run and when you'd like to run it.

CLOSING DATES: To reserve space, you need to call us by 5PM (all continental U.S. time zones), 6 days prior to the Monday issue date. We need your ad materials (camera-ready mechanical or copy for pub-set ad) by 5PM, 5 days prior to the weekly issue.

AD COPY: We'll typeset your ad at no extra charge. You can give us copy via phone, U.S. mail, or FAX. To typeset an ad for you, we need clean, typewritten copy. Figure about 30 words to the column inch, not including headlines. (There are seven columns on each page.)

LOGOS AND SPECIAL ARTWORK: Any logos or special artwork should be enclosed with your ad copy. For best reproduction, please send us either a stat of your logo or a clean sample on white bond paper.

COLUMN WIDTHS AND MINIMUM DEPTHS: Your ad can be one of seven different widths. There is a minimum depth requirement for each width. You can also run larger ads in half-inch increments. The chart below can serve as a reference.

NUMBER OF COLUMNS	WIDTH	MINIMUM DEPTH
1 column	1-1/4"	2"
2 columns	2-5/8"	2"
3 columns	4-1/16"	3"
4 columns	5-9/16"	4"
5 columns	6-15/16"	5"
6 columns	8-3/8"	6"
7 columns	9-3/4"	7"

RATES: Your rate will depend on the size of your ad and whether you choose to run regionally or nationally. The national rate is $14.85 per line or $207.90 per column inch. The regional rate (Eastern, Midwestern or Western editions) is $10.80 per line or $151.20 per column inch. You can run your ad in any two regions for $13.50 per line or $189.00 per column inch. In all cases, you can earn volume discounts.

The minimum ad size is two column inches (1-1/4" wide by 2" deep) and costs $415.80 if run nationally. A sample of this size appears below. You can run larger ads in half-inch increments at $103.95 per half inch. Box numbers are available and cost $25 per insertion ($50 if foreign).

Programmer Analyst

This is a sample ad for Computerworld's Computer Careers section. It will help you decide what size ad you'd like to run. Remember that you can run your ad either regionally or nationally in our recruitment section and that the minimum ad size is one column (1 4/16 inches wide) by two inches deep (like this sample). This ad would cost $415.80 in our national edition, $302.40 in the Eastern, Midwestern, or Western edition, and $378.00 in two regions, volume discounts apply.

SAMPLE AD SIZES AND PRICES: To assist you in planning your recruitment advertising, the following shows common ad sizes and their respective costs

	One Region (East, Midwest or West)	*Two Regions (East/West East/Midwest, Midwest/West)*	*National Edition*
1 column x 2"	$ 302.40	$ 378.00	$ 415.80
2 column x 2"	$ 604.80	$ 756.00	$ 831.60
3 column x 3"	$1,360.80	$1,701.00	$1,871.10
4 column x 5"	$3,024.00	$3,780.00	$4,158.00
5 column x 7"	$5,292.00	$6,615.00	$7,276.50

PAYMENT: If you're a first-time advertiser or if you haven't established an account with us, we need your payment in advance (or with your ad) or a purchase order number. Once you have established an account with us, we'll bill you for any ads you run as long as your payment record is good.

COMPUTER CAREERS NETWORK BUYS: You can take advantage of special rates that let you run your ad in *Computerworld* and *Computerworld*'s sister newspapers at special rates. Choose from *Computerworld Focus on Integration, Network World, InfoWorld, Digital News and Federal Computer Week. Call for details.*

Computerworld Recruitment Advertising Order Form

Ad Size:_____ **columns wide by** _____ **inches deep**

Issue Date(s): _____

Name: _____

Company: _____

Address: _____

Telephone: _____

Region: ☐ **East** ☐ **Midwest** ☐ **West** **National:** ☐
☐ **East/Midwest** ☐ **Midwest/West** ☐ **East/West**

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800-343-6474 (In MA, 508-879-0700)
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Requires BS degree in computer science, business or related field, PLUS 2 years as a computer programmer or analyst. Starting salary Range $1767 - $2847 per month.

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Systems Analyst, 40 hrs./wk., 8am - 4:30pm $52,300/yr., Overtime as needed, compensated at 1½/hr. Job require: Masters degree in Mathematical Sciences OR Computer Science AND 1 yr. experience as a Programmer-Analyst. Job also requ.: 1) 1 grad. course in data structures OR information structures; 2) 1 grad. crse. in which COBOL computer language was studied; 3) 1 grad. crse. in compilers; & 4) 1 grad. crse. in operating systems. Job duties: Analyze, develop, test, implement & debug computer systems for a variety of customer projects & manufacturing industries. Confer with project manager regarding capability of system & projected workload. Use theories of data structures to analyze & implement system. Qualified applicants should send resume & verification of regs. to: 7310 Woodward, #13, Detroit, MI 48202. Ref. #9790. Employer paid ad.

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MARKETPLACE

Snooping about on consultants

Getting the most from one requires more than just asking for references

BY MICHAEL ERBSCHLOE
SPECIAL TO CW

If you are thinking about hiring a consultant to help you design, build or acquire new computer systems or software, there are two important steps you should take. First, ensure you can get what you need by thoroughly checking the consultant's background and qualifications for the specific work you want done. Then, you need to specify in writing exactly what you want the consultant to do.

Before engaging any firm or individual, confirm the quality of the consultant's work through references. Using references provided by the consultant is a good place to start, but you may encounter bias. You should talk to other information systems professionals you know.

Seek out the views of as many different types of IS professionals as possible and talk to end users, too. Include IS directors, operations managers, operators, programmers and, where appropriate, users from a variety of functions such as administration, finance and line units.

The reason for casting such a wide net is that each type of person views a system from a different perspective. An operator might possess the best view of ease-of-use and reliability, while a programmer may have a better perspective on documentation and software maintenance. End users should best be able to tell you if an application package is able to meet user needs.

When checking references, there are several specific questions to ask. Was the specified task completed within budget? To many people, this consideration is the most important one, because so many projects go over budget.

If your sources tell you that there were cost overruns, try to find out why. Doing so is sometimes difficult, and you should keep an open mind regarding the reasons. Were the overruns due to poor budgeting or cost projections? Did they occur because end users, management or the consultant kept adding to the specified requirements?

You need to be extra-inquisitive if you discover the consultant kept making suggestions for additional work. Examine whether this was really necessary.

The second most important aspect of a project is usually whether it is completed on schedule. If the consultant has not finished projects in a timely fashion, find out why. Again, a balanced perspective is helpful. Were there delays because equipment wasn't available? Because key people in the client company couldn't be reached? Or was it because the consultants were not on the job when they should have been?

Many users can deal with cost overruns or falling a little behind schedule, but it is another story when a system doesn't work properly after the consultants walk out the door. If this was the case, it's particularly important to check on the perceptions of people in different positions.

Another key consideration is whether the consultant left tasks for others to handle. Such items might include unfinished training, incomplete or inadequate manuals as well as other documentation or unnecessary files that consume valuable space on disks or tapes and therefore must be removed.

In addition to gauging the satisfaction of previous clients, you need to make sure that the individuals working on your project have demonstrated the specific skills required for the work that you need done.

With an application development project, for example, if one of the programming consultants is a techie with on interpersonal skills, there should be someone to go between him and the end users to conduct needs analyses. Assess the communications skills of prospective consultants; run the individuals by user management and gauge the reaction.

Taking such steps can help control costs. You won't be paying for unnecessary time people would spend learning how to do things you are paying them to accomplish.

You also need to check on a consultant's professional style. Be sure to assess whether the individuals that will work on your project will get along well with your staff. This step can also help reduce costs because your staff and the consultants will spend less time working on their relationships.

Your second major task is to specify the work you want the consultant to perform. The only way to ensure agreement is to get the details in writing. This assurance should be in the form of a contract or, if you've already entered into a master contract with the consultant, through a work order.

Major points to cover in a contract are the specific task to be completed, the total costs or fees for the project, a breakdown of costs for tasks or phases and a schedule for completion.

You should also build in project review steps; they help assure that the project is being completed on schedule. Finally, have your attorney review any contract with a consultant before you enter into it.

IN ADDITION TO gauging the satisfaction of previous clients, you need to make sure that the individuals working on your project have demonstrated the specific skills required for the work that you need done.

Erbschloe is executive editor at Computer Economics, Inc. in Carlsbad, Calif.

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The BoCoEx index on used computers

Closing prices report for the week ending Feb. 16, 1990

	Closing price	Recent high	Recent low
IBM PC Model 176	$550	$700	$400
XT Model 086	$700	$825	$700
XT Model 089	$775	$800	$600
AT Model 099	$1,225	$1,600	$1,200
AT Model 239	$1,700	$1,700	$1,200
AT Model 339	$1,800	$1,800	$1,500
PS/2 Model 50	$1,800	$1,900	$1,500
PS/2 Model 60	$2,425	$2,600	$2,400
Compaq Portable II	$1,700	$1,725	$1,550
Portable III	$2,400	$2,500	$1,900
Portable 286	$1,900	$2,000	$1,700
Plus	$750	$950	$675
Deskpro	$900	$1,200	$800
Deskpro 286	$1,525	$2,025	$1,300
Deskpro 386/16	$2,475	$2,750	$2,475
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The redistricting system will aid in defining new City Council Districts based on 1990 census data. This effort must be defined in time for the November 1991 City Council election. Parties interested in receiving the RFI and/or being included on the Districting System mailing list should write, on company letterhead, to Patricia A. Sisco, Assistant to the Commissioner, Computer and Data Communications Services Agency, 253 Broadway, 9th Floor, New York, NY 10007.

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The benefits of backscratching

Sharing resources can help companies cope with pervasive change

BY SUE REDKEY
SPECIAL TO CW

No matter how you look at it, change is going to be a growing part of our lives in the 1990s. Along with continuing advances in technology, there will be changes in the makeup of the work force as companies rely more on foreigners, the elderly and the handicapped. With highly skilled workers in shorter supply, employers will face greater demand for individualized work schedules.

What can information systems organizations do to succeed in the face of such changes? One important initiative will be effective training and education of IS professionals so that they can cope with the changes they will face.

With training often an early target of corporate belt-tightening, it will be particularly important for IS organizations to find cost-effective ways to provide training, even as instruction must become more timely, creative and user-friendly.

Fortunately, innovative solutions need not be complex or expensive. There are endless economical opportunities available today. IS training organizations need only step out of their traditional mind-sets to recognize the possibilities.

It's important to consider all the available resources — not just tools and technologies but also colleagues, clients, vendors, schools and governments.

Sharing resources is not a new technique in training. Many organizations have successfully shared them internally by enlisting resident experts as volunteers to teach classes. In addition, these individuals serve as official mentors in their areas of expertise.

When resources of various kinds are not available in-house, sharing among companies is another option, one that fewer organizations have considered.

Most companies already engage in a certain amount of information-sharing through user groups and professional associations. Others go further, however; some let workers from other companies attend their in-house training sessions.

Other organizations let people from outside companies stand by and watch as their people install software or equipment that the visitors will be acquiring. Much of this kind of activity can be shared without taking security risks, especially when the exchange is among companies in different industries.

Bernie McGinley, data center education coordinator at Pittsburgh National Bank, has successfully pursued this kind of resource-sharing for years. Another method he recommends is agreements with local training vendors who need classroom facilities.

Under such an arrangement, the vendor uses the company's site to teach courses and, in return, provides the company with free seats. The company solves its need while helping the vendor do the same, and other firms benefit because they can send employees to a local class.

These ideas have worked for companies that have used them. Determining which ones will succeed for a given organization depends on its relations with training vendors and other companies, its commitment to training and education and the resources it is willing to share.

There are some other challenges that IS training organizations will face in coping with the accelerating changes of the 1990s. Training once meant a stand-up instructor in a classroom. With changes in technology, the work force and the economy, the notion now encompasses a broader range of options. They include self-study courses at a workstation as well as classrooms in remote locations linked by global satellite transmissions, perhaps in an interactive mode.

Where trainers once assumed that instruction had to be provided in training facilities during the standard work day, they now must realize it can take place in the student's office or home at any hour.

Where trainers once considered colleges and universities as far away from the real world as possible, they now need to encourage creative partnerships between business and higher education. Forging such relationships can bring schools closer to business reality. Both the schools and the business community will benefit if students are better equipped to meet the demands of the workplace.

IS trainers, with other corporate educators, will also need to accommodate greater differences among learners and provide professional development in addition to skills training.

Underlying many of these steps will be the need to foster effective change management as IS professionals struggle to accept new technologies and new ways of working. Trainers must do more than demonstrate the use of new tools and discuss the fine points of new methodologies. They must help workers adopt a new way of looking at how they get things done. The workers need more than skills; they need an understanding of why they must change and a willingness to use new tools and technologies.

Redkey is an independent instructor, consultant and writer and author of *The Technical Instructor's Handbook: From Techie to Teacher.*

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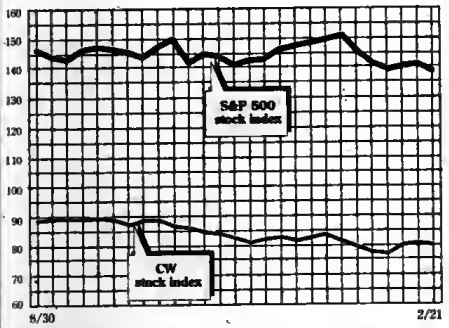
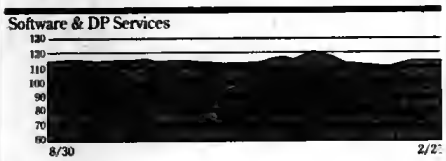
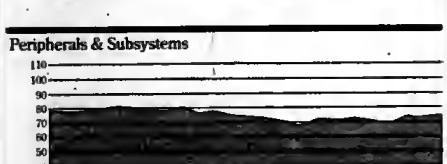
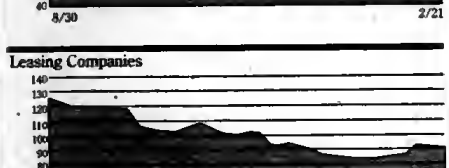


Indexes	Last Week	This Week
Communications	116.6	113.7
Computer Systems	77.7	75.7
Software & DP Services	115.2	113.9
Semiconductors	51.1	51.2
Peripherals & Subsystems	73.9	75.8
Leasing Companies	93.4	91.0
Composite Index	81.6	80.8
S&P 500 Index	140.1	138.3







Computerworld Stock Trading Summary

CLOSING PRICES WEDNESDAY, FEB. 21, 1990

EXCH		52-WEEK RANGE		PRICE CLOSE FEB. 21 1990	WEEK NET CHANGE	WEEK PCT CHANGE
Communications and Network Services						
N	AMERICAN INFO TECHS CORP	88	60	66	-1.5	-2.2
Q	ANDREW CORP	66	16	23.25	-0.3	-2.1
Q	ARTEL COMM CORP	6	2	7.8	-0.3	-3.2
N	AT&T	47	30	38.75	-1.3	-3.1
Q	AVANTEK INC	7	3	2.75	-0.3	-10.0
N	AYDIN CORP	21	14	14.875	0.1	0.8
N	BELL ATLANTIC CORP	114	72	86.75	-5.0	-5.4
N	BELLSOUTH CORP	89	60	81.5	-1.5	-3.1
Q	COMPRESSION LABS INC	13	4	11	-0.5	-4.3
Q	CONTEL CORP	37	23	26.375	-0.6	-2.8
Q	DATA SWITCH CORP	5	3	2.25	0.0	0.0
Q	DIGITAL COMM ASSOC	66	17	19.25	-0.8	-4.3
Q	DYNATECH CORP	31	16	15.5	-0.5	-3.1
Q	FIBRONICS INTNL INC	7	4	5.625	-0.3	-4.3
Q	GANDALF TECHNOLOGIES	7	3	2.75	-0.5	-18.5
N	GENERAL DATACOMM INDS	7	4	4.25	-0.1	-2.9
N	GTE CORP	72	44	59	-2.5	-4.1
Q	INFOTRON SYS CORP	13	6	6.5	-0.3	-3.7
N	ITT CORP	66	51	53.5	0.5	1.3
N	M/A COM INC	5	4	4.5	0.0	0.0
Q	MCI COMMUNICATIONS CORP	49	24	31	-0.1	-0.4
N	NETWORK EQUIP TECH INC	32	16	30.625	1.0	3.4
Q	NETWORK SYS CORP	11	7	10.5	1.3	13.5
Q	NORTHERN TELECOM LTD	29	14	23.125	-0.4	-1.8
N	NOVELL INC	85	65	65	-0.3	-0.7
N	NYNEX CORP	92	67	77	-2.0	-2.5
N	PACIFIC TELESIS GROUP	52	33	42	-2.5	-5.1
A	PEIRIL CORP	9	4	6.5	-0.9	-13.7
N	SCIENTIFIC ATLANTA INC	25	14	31.125	-2.5	-11.1
N	SOUTHWESTERN BELL CORP	65	43	52.625	-0.3	-1.3
Q	3 COM CORP	29	10	11.875	0.5	4.4
N	US WEST INC	61	56	58.25	-1.3	-1.8
Computer Systems						
Q	ALLIANT COMPUTER SYS	8	3	7.375	-0.5	-6.3
Q	ALPHA MICROSYSTEMS	8	4	3.875	0.0	0.0
Q	ALTOS COMPUTER SYS	8	5	5.25	0.0	0.0
A	AMDAHL CORP	23	11	13.875	-0.8	-5.1
Q	APPLE COMPUTER INC	50	22	34	-0.3	-0.7
N	BOLT BERANEK & NEWMAN	10	5	5.875	0.4	9.8
N	COMPAQ COMPUTER CORP	113	65	83.375	-4.4	-5.0
N	COMMODORE INTNL	20	7	8	-0.4	-4.5
N	COMPUTER AUTOMATION INC	5	3	2.575	-0.4	-13.2
N	CONTROL DATA CORP	24	16	16.5	-0.3	-1.5
N	CRAY RESH INC	61	31	46.5	0.8	1.9
Q	DAISY SYS CORP	6	0	0.563	-0.1	-9.5
N	DATA GEN CORP	15	6	6.75	-1.1	-11.4
N	DATAPOINT CORP	5	3	2.625	-0.3	-16.0
Q	DELL COMPUTER CORP	5	2	6	-0.1	-2.0
N	DIGITAL EQUIP CORP	116	71	72.875	-4.6	-9.3
N	FLOATING POINT SYS INC	4	1	1.5	-0.1	-7.7
N	HARRIS CORP	40	27	30.25	-1.3	-4.0
N	HEWLETT PACKARD CO	66	40	42.125	-4.8	-9.9
N	HONEYWELL INC	92	92	76.625	-2.1	-2.7
N	IBM	168	93	104.875	1.1	1.1
Q	INFORMATION INTL INC	16	12	12.25	0.0	0.0
Q	IPL SYS INC	5	5	5.875	0.0	0.0
N	MAI BASIC FOUR INC	10	3	2.875	-0.1	-4.2
N	MATSUSHITA ELEC INDL LTD	186	146	146.625	-7.4	-4.8
Q	MENTOR GRAPHICS CORP	22	14	16	0.9	4.9
N	NBI INC	3	0	0.344	0.0	-8.3
N	NCR CORP	71	53	67.625	-0.3	-0.4
Q	PYRAMID TECHNOLOGY	65	6	24.125	1.0	4.3
Q	SEQUENT COMP SYS INC	23	10	20	-1.3	-5.9
Q	SHAREBASE CORP	3	0	0.563	0.1	28.5
Q	SUN MICROSYSTEM INC	23	13	21	-1.0	-4.8
Q	SYMBOLICS INC	3	1	0.813	0.0	0.0
N	TANDEM COMPUTERS INC	65	15	27.75	-0.8	-2.8
N	TANDY CORP	49	22	32.125	-0.4	-1.3
N	ULTIMATE CORP	13	6	6.5	-1.0	-13.3
N	UNISYS CORP	30	13	14.375	0.0	0.0
A	WANG LABS INC	16	4	4.125	0.0	0.0
Software & DP Services						
Q	AMERICAN MGMT SYS INC	16	11	11.625	-0.4	-3.1
Q	AMERICAN SOFTWARE INC	23	12	15.375	0.4	2.9
N	ANACOMP INC	5	3	3.5	0.0	0.0
Q	ANALYSTS INTL CORP	20	11	16	-0.3	-1.8
Q	ASHTON TATE	24	9	11	0.0	0.0
Q	ASK COMPUTER SYS INC	17	7	5.875	0.1	1.4
N	AUTO DATA PROCESSING	51	36	48.75	0.9	1.9
Q	AUTODESK INC	66	27	45.25	1.0	2.3
Q	BMC SOFTWARE INC	33	15	30.25	0.0	0.0
N	BUSINESSLAND INC	14	7	7	-0.3	-3.4
Q	COGNOS INC	8	4	4.438	0.0	0.0
N	COMPUTER ASSOC INTL INC	222	111	121.625	-0.3	-3.6
Q	COMPUTER HORIZONS CORP	11	7	9.75	0.3	3.5
N	COMPUTER SCIENCES CORP	66	47	47.5	-1.6	-3.8
N	COMPUTER TASK GROUP INC	15	8	8.625	0.1	1.3
Q	COMSHARE INC	42	66	36.5	-1.0	-3.9
Q	CORPORATE SOFTWARE	16	8	10.75	1.8	19.4
N	GENERAL MTRS (CLS E)	66	43	52.25	0.1	0.3
Q	HOGAN SYS INC	7	4	4.125	0.1	3.1
Q	INFORMIX CORP	17	5	13.875	-2.6	-16.9
Q	INTELLICORP INC	5	3	5	0.0	0.0
Q	LEGENT CORP	22	31	26.25	-0.3	-2.5
Q	LOTUS DEV CORP	34	18	28.5	-1.8	-5.9
Q	MICROSOFT CORP	101	66	96.125	1.1	1.2
Q	NATIONAL DATA CORP	35	65	39	-1.3	-4.1
Q	ON LINE SOFTWARE INTL INC	11	6	8.25	-1.4	-14.3
N	ORACLE SYS CORP	26	11	22.375	-1.3	-5.3
N	PANSOPHIC SYS INC	16	12	14.75	-0.6	-4.1
Q	PHOENIX TECHNOLOGIES INC	18	3	3.375	-0.2	-5.3
Q	POLICY MGMT SYS CORP	66	22	33.75	0.0	0.0
Q	PROGRAMMING & SYS INC	22	16	17	-0.5	-2.8
Q	RELATIONAL TECH INC	16	5	8.25	0.3	3.1
N	REYNOLDS & REYNOLDS CO	34	19	20	-0.5	-2.4
Q	SAGE SOFTWARE INC	11	7	9.5	-0.3	-2.6
Q	SEI CORP	20	16	19.5	0.0	0.0
Q	SHARED MED SYS CORP	16	12	12.375	0.1	1.0
Q	SOFTWARE PUBG CORP	31	10	13.25	0.0	0.0
A	STERLING SOFTWARE INC	6	5	5.375	0.0	0.0
Q	SUNGARD DATA SYS INC	66	13	30.25	-0.3	-3.4
Q	SYSTEMATICS INC	40	30	28.5	-0.3	-1.7
N	SYSTEM CENTER INC	28	16	23.25	-0.3	-2.1
N	SYS. SOFT INC	65	13	23.25	0.1	0.8
Q	WORDSTAR	3	1	0.875	0.0	0.0
Semiconductors						
N	ADV MICRO DEVICES INC	11	7	7.5	0.4	5.3
N	ANALOG DEVICES INC	13	7	8	0.6	8.7
Q	ANALOGIC CORP	11	8	9.875	0.0	0.0
Q	CHIPS & TECHNOLOGIES INC	66	14	15.5	-0.1	-0.3
Q	INTEL CORP	42	23	38.875	-1.1	-2.8
Q	MICRON TECHNOLOGY INC	66	7	10.25	0.6	6.8
N	MOTOROLA INC	64	40	57.875	-1.3	-2.1
N	NATL SEMICONDUCTOR	6	5	6	-0.1	-2.0
N	TEXAS INSTRS INC	47	28	32.25	-1.1	-3.4
A	WESTERN DIGITAL CORP	15	6	6	-0.4	-4.0
Peripherals						
Q	ALLEN CORP	3	1	1.75	0.0	0.0
N	AM INTL INC	5	3	3.625	0.0	0.0
Q	AST RESH INC	18	7	14.75	0.3	1.7
Q	AUTO TROL TECH CORP	6	6	3.25	0.0	0.0
Q	BANCTEC INC	20	11	16	0.4	2.1
Q	CIPHER DATA PRODS INC	11	4	7.5	0.0	0.0
A	COGNITRONICS CORP	8	6	4.875	0.0	0.0
Q	CONNER PERIPHERALS	15	7	15.75	0.1	0.8
A	DATAPRODUCTS CORP	16	6	6	0.1	2.1
A	DATARAM CORP	13	6	11.75	-0.8	-6.0
N	EASTMAN KODAK CO	92	37	38	-0.8	-1.5
N	E M C CORP MASS	6	3	5.125	0.9	20.6
Q	EMULEX CORP	13	5	5.125	-0.1	-2.4
Q	EVANS & SUTHERLAND	26	17	24.5	-0.3	-1.0
A	ICOT CORP	3	1	1.8	0.1	6.1
Q	INTERLEAF INC	10	5	5.75	0.0	0.0
Q	IOMEGA CORP	4	2	3.5	0.2	9.8
Q	LEE DATA CORP	4	1	1.8	0.0	0.0
Q	MAGISTOR SYS CORP	4	1	1.438	-0.3	-25.8
Q	MAXTOR CORP	12	7	10.5	-0.3	-2.3
Q	MICROPOLIS CORP	8	3	5.375	0.4	7.8
N	MINNESOTA MNG & MFG CO	84	66	77.375	-2.8	-3.4
Q	PERSONAL COMP PRODUCTS INC	6	4	4.188	0.3	9.8
Q	PRINTRONIX INC	11	7	10.625	-0.4	-3.4
N	QMS INC	16	7	11.6	-0.3	-1.8
Q	QUANTUM CORP	17	5	10.75	0.4	3.8
N	RECOGNITION EQUIP INC	18	8	8.25	0.0	0.0
Q	REXON INC	8	6	7.188	0.3	3.6
Q	SEAGATE TECHNOLOGY	30	9	16.5	0.3	1.4
Q	STORAGE TECH CORP	23	9	16.625	-0.1	-0.7
Q	TANDON CORP	1	0	1.125	0.3	38.4
N	TEKTRONIX INC	24	16	15.375	-1.0	-6.1
Q	TELEVIDEO SYS INC	1	0	0.313	0.1	42.9
N	XEROX CORP	66	50	51.25	-0.5	-1.0
Leasing Companies						
Q	AMPLICON INC	115	6	9.375	1.0	11.9
N	CAPITAL ASSOC INTNL INC	5	3	3.25	-0.3	-7.1
N	COMDISCO INC	34	21	22.5	-1.0	-4.3
Q	CONTINENTAL INFO SYS	3	0	0.344	0.0	0.0
Q	LDI CORPORATION	18	13	14	-0.3	-1.8
Q	PHOENIX AMERN INC	6	6	3.25	0.0	0.0
Q	SELECTERM INC	6	6	5.875	-0.1	-2.1

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DEC-line

DEC teeters toward threshold of impending quarterly loss

Investors just said no to Digital Equipment Corp. last week, while the No. 2 computer maker watched its stock drop five full points by Thursday's close. DEC stock hit bottom, setting a new 52-week low of 70⅛ on Thursday in the face of a possible storm: The company may see its first quarterly loss ever on March 31 (see story page 1).

The news was not all that sunny elsewhere in the technology market. Hewlett-Packard Co. lost 2¼ points, closing Thursday at 41¾, after turning in a less-than-favorable fourth-quarter earnings report. Compaq Computer Corp. also lost ground last week, finishing 3½ points down at 82.

Microsoft Corp. took a chilling 4¼ point dip on Wednesday, finishing Thursday at 96⅛, down 1⅝ for the week. Among others joining the down crowd were Lotus Development Corp., falling 1¼ to 28¼; IBM, slipping ¼ of a point to 103¼; AT&T, down 1⅛ to 38½; and Bell Atlantic, which ended trading Thursday at 86⅛, after sacrificing 4⅝ points.

Intel Corp. fell 1¼ to 38¾, while two competitors gained: National Semiconductor inched up ¼ of a point to 6¼, and Advanced Micro Devices, Inc. copped ½ of a point to finish at 7¼.

KIM S. NASH

FAA

FROM PAGE 1

The FAA's modernization plan is an average of four years behind schedule. The entire project was originally supposed to take 12 years and cost $12 billion. Outages such as the one at Dallas-Fort Worth are the proverbial tip of the iceberg.

Starting tomorrow, the FAA will appear before the Aviation Subcommittee of the House of Representatives' Public Works Transportation Committee to justify its computer modernization plan for budget authorization. Every few years, the FAA must answer to Congress in order to have funds set aside for its modernization effort, now estimated to total $27 billion.

Once those funds are put aside, the House and Senate Appropriations Committees review the FAA plans on a project level for direct funding. Other standing committees have touched on the FAA's problems in implementing the modernization plan, and the U.S. General Accounting Office (GAO) has dogged the FAA for 10 years with its advice.

If these hearings are like those of the past, representatives may ask a few technically sophisticated questions of the FAA. They will likely not take action to force the FAA to speed implementation of the technological infrastructure needed to ensure that some of the nation's 455 million annual airline passengers will not be lost on an air traffic controller's screen during a computer outage.

When the National Airspace System (NAS) plan was introduced, air traffic was on a steep increase because of airline deregulation in 1978. "The FAA found itself on the back end of the controllers' strike and having reliability problems," said Martin Pozesky, assistant administrator for the NAS program at the FAA. At a time when transistors and semiconductor chips were revolutionizing computer technology, "we were the largest consumer of vacuum tubes in the nation," Pozesky said. "We needed to build a new technical and work force base."

Big buys

NAS, that new technical base, included 92 separate projects — 12 of which were deemed "major systems acquisitions" because of their cost and critical nature.

One of those major systems is the Advanced Automation System (AAS), which will provide updated tracking displays to air traffic controllers. That program was scheduled to be completed this year but is now expected to be implemented in 1993.

Another primary system is mainframe "Host" computers at 20 control centers across the nation used to filter and feed data to air traffic controllers. Other projects under the NAS plan include a microwave landing system, an automated weather-observing system and a voice switching and control system.

Of the 12 major projects, only the host system is in place, and it has been technologically outdated for about five years.

The Host computer, an IBM 3083 mainframe, replaced IBM 9020 computers. The 9020s were custom-made for the FAA in the 1960s, according to IBM. By the time the 3083s were installed, however, the next generation of IBM mainframes, the 3090-class, had already been available for a year. The host was implemented on time and $16 million over budget.

The FAA admits to optimism in the early 1980s. "In retrospect, the NAS plan was not thoroughly thought out," Pozesky said.

Various government agencies have given the FAA advice over the years, yet it listened to a different drummer — ignoring critical recommendations from many parts of government.

For example, in 1982 the White House Science Council told the FAA in no uncertain terms to "engage a prime contractor to formulate performance goals, design specifications and systems integration, [including] design, implementation and maintenance of hardware and software" for NAS. The council went on to say, "The FAA must contract this task to an independent, experienced private-sector organization . . . rather than attempt to acquire this capability in-house."

Modernization costs

Development problems have plagued projects included in the National Airspace System

Statements made by Martin T. Pozesky, acting deputy associate administrator for the NAS program (April 8, 1987)	Inadequately defined requirements	Testing, technical or software problems
En route system		
• Voice switching and control	Yes	Yes
• Advanced automation	Yes	Yes
• Host computer	No	Yes
Flight service and weather system		
• Flight service automation	No	Yes
• Automated weather observation	Yes	Yes
• Central weather processor	No	No

Source: U.S. General Accounting Office — CW Chart: John York

The FAA decided not to follow the White House advice because it wanted to continue day-to-day operations of the nation's airways during the modernization plan. According to Pozesky, the FAA did not feel it could separate the daily responsibilites from modernization. "We would have had to turn over the current air traffic control along with the modernization plan and then have [the contractor] turn it back to us at the end," he said.

Pozesky added that the White House was familiar with systems projects built from scratch — such as weapons projects at the Department of Defense or space shots from NASA — instead of making new projects work with existing equipment. The FAA, he said, did not fit that mold and thus felt justified in not hiring a prime contractor.

Its alternative

Instead, the FAA engineered a hybrid contracting position. "They introduced a concept called a systems engineering and integration contractor, which Martin Marietta won," said Allen Li, assistant director of aviation for the GAO, Congress' investigative arm. "The contractor is partner to FAA, but Martin [Marietta] has no authority over any of the other contractors. They can't go out and kick somebody's rear end on this."

After six years, Martin Marietta's contract is winding down, and the FAA still needs advice. It is turning now to the Federal Systems Group of TRW, Inc., which outbid Marietta at $139 million. The TRW contract is a "gap-filler," as Martin Marietta's role decreases in this project, according to Don Mullikin, the FAA's automation system division manager. Mullikin said he expects to rely on TRW for more of the day-to-day management of the program.

AAS will replace FAA's aging air traffic control display and radar communications with completely new hardware, software and controller workstations at major air traffic control facilities across the nation, including airport towers. TRW will be monitoring IBM, which received a $3.6 billion contract for the AAS in 1988, and its subcontractors.

Li is concerned that vendors may not see much difference between Martin Marietta and TRW, despite the additional cost to the public. In its advisory capacity, TRW believes it can work behind the scenes with vendors. "This way, IBM isn't threatened," said Wilson N. Felder, TRW's FAA project manager.

And IBM does not appear to be threatened by TRW, the GAO or Congress. Sue Murphy, functional manager for IBM's AAS software development, said that IBM has monthly meetings with Martin Marietta and infrequent visits from the GAO. She agreed that Martin Marietta has not been forceful in its oversight. Martin Marietta declined to comment.

Disapproval

Even before the NAS plan was put before Congress in 1980, the staff of the Senate Appropriations Committee chided the FAA's systems planning methods. "The FAA has no ongoing, well-defined and systematic management approach to evaluating software and operational cost, capacity and performance of the current system to meet projected short-range workloads," according to a committee report.

Since then, the GAO has twice formally reported the same lack of capacity planning to the FAA, according to Joel Willemssen, assistant director of the information management and technology division at the GAO.

While the FAA has not formally replied to the GAO, Pozesky said interim steps are being taken — such as adding solid-state memory to current air traffic control displays — to increase capacity. He added that the FAA still does not know how much CPU power it needs but that interim steps and the addition of the Host computer should take care of capacity needs until the NAS plan is implemented.

Li and Willemssen have been issuing constant suggestions to the FAA though Congress for 10 years. But the "droning," as they put it, is on a policy level; it does not feed Congress much technical information to help manage its technology infrastructure.

Control points

No one decision made by Federal Aviation Administration officials led to the snail's pace implementation and wildly inflated costs of the National Aviation System (NAS).

The following have been major contributors to the FAA's problems, according to public records and interviews with government officials and others involved:

- The FAA has ignored some crucial advice from the White House, even though it is an agency organized under the executive branch. In 1982, the White House advised the agency to hire a prime contractor for the huge project. The FAA instead chose to be its own prime contractor.

The FAA did hire another contractor, Martin Marietta, but gave it no authority to run the project, only to advise the agency. Recently, the FAA decided that since Martin Marietta's contract was winding down it needed more oversight advice and another contractor, TRW, for an initial $183 million, to watch over the modernization plan.

- The FAA has ignored some crucial advice from the General Accounting Office and the Senate Appropriations Committee staff. Both have been asking, for 10 years, that the FAA have some means of capacity planning. There is still no capacity planning in place.
- House and Senate Appropriations Committees, through their subcommittees on transportation, act as the FAA's bosses, but they have been hampered by lack of technical information. The General Accounting Office decides what is of interest to policy-makers — and what is not. The office goes to great pains to make the FAA's problems understandable to laymen, thus leaving out much technical detail, particularly regarding industry trends.
- Unlike other government agencies that compete for funding, money for computer modernization is not a problem — but the federal deficit is. The flying public and aircraft owners pay into the $41 billion Airways Trust Fund for FAA improvements. However, Congress never appropriates all the money in the trust fund. The balance is used, like Social Security, to make it appear as if there is less of a federal deficit than actually exists. Still, there is a move to increase user taxes for the fund.
- NAS' plan is based on such antiquated technology that at least one group, the Aircraft Owners and Pilots Association, is calling for the FAA to dump all of its plans, write off the losses and move to a hybrid land and satellite-based control system.

J. A. SAVAGE

"Our job is not so much to report on specific technical complexities," Li said. "Our job is to take the technology and translate it to the point where it affects policy-type issues and policy decisions."

Acting as Congress' superego, the GAO attempts to keep FAA operating according to an auditor's judgment calls and established policy guidelines. However, no matter how much the GAO flails away at FAA management problems, the FAA does not take orders from the GAO. The GAO advises Congress, and Congress is charged with managing the FAA.

Congress' appropriations committees appear to be somewhat technically sophisticated. In the past, they have requested information on Ada language programming and CPU overload. But in appropriations hearings on the NAS plan, Congress has apparently not been informed of, and has not demanded, information on more comprehensive technology trends.

"We're getting as much [technical information] as we can absorb, but we don't know what we're not getting," said an appropriations committee staff member who asked not to be named. The GAO is expected to give the committee what is useful, and the FAA is expected to manage technical details, he said.

Attention to detail is not off-limits to the committees, but they are lacking insight into technological progress. For instance, the staff member said that while the committee members would understand the difference between mainframes and minicomputers, they were never given the information that smaller systems are approaching mainframe utility at a fraction of the cost.

Good for them, too

Pozesky said that even the FAA would like to see a technically educated Congress. "They're spending lots of dollars, and it affects every American. When you are dealing with a better-educated boss, you can reach a better deal," he said.

Although Congress has authority over spending, competition with other government programs is not an issue in funding FAA modernization plans. The flying public, through ticket taxes, and aircraft owners, through fuel and tire taxes, have contributed $41 billion during the past 20 years to the Aviation Trust Fund.

This month, Congress is expected to ask for increased taxation despite the presence of $7 billion in unallocated money currently in the fund.

"We'd like to draw that down," said David Traynham, an aviation staff member for the House Committee on Public Works' Transportation Subcommittee. "But the votes aren't there — much the same as Social Security," he added, referring to the current debate on whether unspent Social Security funds should be counted against the deficit. About $1 billion per year from the Social Security account appears on the government ledger as an offset to the federal deficit, which amounted to a $152 billion budget deficit in 1989.

Commercial airlines would presumably have a stake in opposing increased taxes while the airways fund is still in the black, but they do not appear to be lobbying heavily against it.

While the Air Transport Association of America, an organization representing commercial airlines, is planning to give testimony this week against the plan, a spokesman would only say that because "money has been collected for a special purpose, there shouldn't be reluctance to spend it."

Private pilots are taking a strong stand, however. The Aircraft Owners and Pilots Association (AOPA), a group representing 300,000 noncommercial owners, said money set aside for FAA improvements should not only be spent but that it should also be spent on current technology. The group wants to discard much of the NAS program.

Satellites preferred

Instead of NAS as a ground-based system, AOPA wants a hybrid satellite and ground-based system that would replace much of the NAS plan objectives with satellite communications. AOPA estimates such a hybrid would save $6 billion more than the current proposal.

"If we can't get Congress to throw down the gauntlet [with the hybrid direction], we're going to have to say we just can't get there from here," said Stephen Bassett, senior vice-president of government and technical affairs at AOPA.

Although admitting frustration with NAS plan progress, the FAA and commercial airlines say the NAS plan is one way of getting there from here. The FAA is looking into satellite operations, but "satellites aren't a replacement for the current air traffic control plan," Pozesky said. Commercial airlines are aiming toward the year 2010 for satellite-based systems.

The GAO, despite its criticism of NAS plan implementation, is also not in favor of starting all over again. "It's like you're six months pregnant and an abortion is not advisable," Li said. "We also see a glimmer of hope."

Next week: How safe the current system is and what the FAA is doing to extend 20-year-old technology.

Crash shines light on computers

India Airlines disaster puts focus on guidance, navigation systems

BY AMIEL KORNEL and SALLY CUSACK
CW STAFF

Crosswinds were light and skies blue as Indian Airlines Flight IC 605 descended toward the dusty runway at Bangalore. Visibility and conditions for a midday landing at the southern Indian city were optimal.

However, something suddenly went tragically awry. Three hundred yards short of the runway, the plane — the most computerized in civilian aviation — hit a grassy field, bounced and then tore into a wall that sheared off its two engines. Ninety of the 146 passengers and crew aboard died in the ensuing inferno.

Although the cause of the crash is likely to remain unknown until civilian aviation authorities complete their investigation, the Feb. 14 accident has already focused attention on the growing use of computers in commercial aircraft. The Indian pilot, reportedly one of the company's most experienced, was seated in the computer-crammed cockpit of an Airbus 320, a controversial jet manufactured by the European consortium Airbus Industrie.

Industry consultants said investigators would no doubt look closely at whatever role the plane's automated flight guidance and navigational systems might have played.

How safe?

"There is still concern about the safety of fly-by-wire aircraft," said Earl Weiner, professor of management science and industrial engineering at the University of Miami and a consultant to the National Aeronautics and Space Administration's Ames Research Center in California.

Fly-by-wire refers to computer-controlled electronics that guide movement of a plane's rudder, flaps and other hydraulic systems. Such systems help pilot the Concorde supersonic airliner, the F16 fighter and, reportedly, the B-2 Stealth bomber.

Ever since digital technologies were introduced in aviation, doubts have been raised about software reliability and the capability of such systems to deal with input errors. Incorrect keying of flight data into the navigational system of a Korean Airlines B-747 was suspected of having caused the plane to fly off-course on Sept. 1, 1983 and into the gunsights of Soviet fighters.

Concerns about the dependability of electrical systems running on-board computers led regulators from the Federal Aviation Administration to require that the A-320 meet special conditions for operating with mechanical backup power generators, according to official documents published by the Department of Transportation.

However, most of the fears about operating highly automated aircraft seemed to have been largely allayed before this month's crash, said pilots contacted at Lufthansa German Airlines, British Airways, Pan American World Airways and Northwest Airlines.

They noted that digital avionics are becoming increasingly common. The Boeing 737-400, 757 and 767, as well as the Airbus 310 and 320, are among the aircraft equipped with so-called glass cockpits, where multiple rows of dials have been replaced by cathode-ray tubes.

Photo courtesy AP/Wide World

Indian Airlines *jet after Feb. 14 disaster that has investigators looking at role of plane's computer guidance systems*

The A-320 has six computer screens with displays showing navigational information, engine parameters and system diagnostics. In addition, the pilot can call up colored graphics showing, for example, a dynamically changing map of aircraft position or a map of emergency landing fields.

The A-320 also uses software to define a flight-protection envelope. It sets limits for such things as pitch, bank angle and speed.

Such features are cited by the manufacturer and many pilots as enhancing the safety of the airliner. "Digital avionics," said Arnie Reiner, chief technical pilot at Pan Am, "minimize errors that crews might make."

An Airbus spokesman speculated that the Indian Airlines pilot may have been flying in manual mode during his final approach to Bangalore, thereby foregoing many of the computer-based system's safety features.

However, the recent accident nonetheless casts fresh doubts on the technology. Indian Airlines announced last week that it was grounding its 14 other A-320s and suspending delivery of 16 that are on order, pending the outcome of the investigation.

In total, 79 of the aircraft are in service worldwide, out of 520 ordered.

Experts warn that while reducing the likelihood of some errors, automation can increase the possibility of major blunders. While most planes today have some automatic piloting capability, fly-by-wire technology makes it possible to automate the entire flight — from firing engines and take-off to landing. With pilots thrust into the role of system managers, their ability to respond to sudden incidents might be lessened, experts said.

"To a certain extent, you can automate a system to prevent an accident," said Leonard Wojcik, an analyst at the Flight Safety Foundation in Arlington, Va. "But there is always a danger that automation alone won't save you. That's why you need a pilot in the loop."

Moreover, some pilots fear an erosion of their skills.

"The danger of automating everything is that you don't leave a lot for the pilot to do," said John Duncan, chief technical pilot at British Airways. "If you reduce the work load too much, the pilot might become inefficient."

Pilots have raised additional concerns regarding the inability to make sudden or quick changes in computerized or highly automated cockpits. John O'Brien, director of engineering and air safety at the American Pilots Association, based in Washington D.C., said that last-minute changes in landing procedures must be executed manually.

"It's just too cumbersome to reprogram the things, especially in a two-crew, heavy-traffic environment," O'Brien said.

The Bangalore tragedy was not the first accident involving one of the technologically advanced A-320s, in commercial operation only since April 1988. One of the planes crashed in June 1988 during an air show near Mulhouse, France, after it stalled during a low pass.

NEWS SHORTS

HP ships Vectra 486

It led the wave of EISA rollouts, becoming the first Gang of Nine to announce an Extended Industry Standard Architecture personal computer last October. Now, Hewlett-Packard Co. has begun shipping its Vectra 486 following lengthy delays caused by bugs in the Intel Corp. 1486 chip. The company said that "all Intel microprocessors used in the Vectra 486 PC have passed HP's quality-testing procedures."

AISP packs it in

The Association of Information Systems Professionals (AISP), which once thrived as the International Word Processing Association, has disbanded. Deerfield, Ill.-based AISP, deeply in debt and down to less than 2,000 members, announced it has terminated the association and canceled its annual Syntopican conference in Phoenix June 24-28. Founded in 1973 and focused on word processing in the early 1980s, the association once had more than 16,000 members.

DCA extends service plan

A customer-service program is being offered by Digital Communications Associates, Inc. (DCA) for users of its coaxial and local-area network gateway software products. Customers can purchase yearly contracts for the plan, which entitles them to be notified of changes and updates to covered products and new software releases as they become available. The program also provides contract customers with priority telephone access to the vendor's support specialists. Pricing is based on the size of the customer's installed DCA product base.

Pajamas as uniform of the day?

US West Communications and IBM are conducting an Integrated Services Digital Network (ISDN) pilot in which employees of the two companies are working at home and using their telephones — *sans* modems — to access their office computers for voice, data, facsimile, imaging and video communications. The carrier is supplying an ISDN line to each participant's home, where an IBM 7820 ISDN terminal adapter connects users' IBM equipment to the ISDN line, which links into the IBM Information Network. The trial will test the feasibility of bringing ISDN to the home as well as its "long-range economic and social ramifications," the companies said.

Eyes of Texas on Japan

Advanced Micro Devices (AMD) is selling two of its San Antonio semiconductor facilities to Japan's Sony Corp. in exchange for $55 million and an inside look at how Japanese companies manage chip factories. Sony intends to refurbish one idle production line and use it to make advanced memory chips called SRAMs. Sunnyvale, Calif.-based AMD will in turn assign engineers to watch how Sony staffers set up and manage the refurbished factory to get the highest level of productivity.

On-shore manufacturing spells cuts

Televideo Systems, Inc. last week announced dramatic list price reductions for its computer system products, reportedly by as much as 20%. The San Jose, Calif.-based company attributes the price slashing to cost reductions incurred when its manufacturing operations were moved back to its U.S. facilities. Televideo produces Intel 80386-based systems and 80286 diskless workstations.

Sony makes DAT available

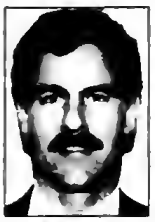
Sony Corporation of America last week announced full availability of its high-performance SDT-1000 Digital Data Storage digital audio tape drives. Intended for high-capacity data backup applications in minicomputers, micros and local-area networks, the industry-standard drives provide up to 1.3G bytes of storage. Sony is marketing the SDT-1000s through value-added resellers, systems integrators and manufacturers at $2,000 per drive.

Norwest banks on EDI as account marketing tool

BY SALLY CUSACK
CW STAFF

MINNEAPOLIS — Will a hefty investment in electronic data interchange (EDI) pay off for Norwest Bank Minnesota? Norwest hopes its new EDI cash management program, designed to service the demands of existing clients, will also attract some major new accounts.

According to Michael Abbott, EDI product manager at Norwest, the program will typically be used by large clients who wish to exchange payments and related documents electronically with other companies. The bank, which began using EDI in 1989, currently has about 29 clients that use EDI technology. Previously, transactions were processed in both paper and electronic form.



Norwest's Abbott

"We're seeing more and more customers requesting it, particularly on the cash-receiving side," Abbott said.

Cash management applications requiring EDI typically include Automated Clearing House (ACH) items, such as electronic payroll deposits, automatic debits and Corporate Trade Payments.

Norwest Bank Minnesota is an affiliate of Norwest Corp., the $24 billion diversified financial services company, and is reported to be the second largest ACH originator in the country.

In addition to the ACH programs, Norwest Bank also offers the Lockbox remittant banking program. Currently a paper-oriented transaction, Lockbox has its own post office ZIP code, and it facilitates payments between the bank's larger customers and their clients. Smaller organizations may elect to pay via the Lockbox system or the EDI program. "With the EDI software, we can now translate both ACH and Lockbox into ANSI for our customers. We send the customer a transmission in either ANSI X.12 820 or ANSI X.12 823, and they update their accounts receivables accordingly," Abbott said. He added that the EDI function is transparent and that smaller clients need not invest in new accounts packages.

According to C. T. Howell, chairman of Harbinger E.D.I., an Atlanta-based EDI network and software supplier, it is still very early in the game for EDI-based cash management programs.

"Most large banks with sophisticated cash management programs are currently developing EDI systems, but there are probably only 20 or 30 such programs that are actually up and running," Howell said.

Many large corporations will no longer accept any other payment methods, Abbott noted. This creates a trickle-down effect for the smaller organizations. "We have customers coming to us who need EDI services to pay their bills," he said. "Still, EDI is only looked at by about 10% of our customers, with the demand for electronic payment much greater on the collection side of things."

Norwest uses EDI translation software, developed with Advantage Systems, Inc. in Waltham, Mass., to process payments, perform translations and transmit data. The function is reportedly transparent to the originator, and the customer only has to be able to accept the ANSI 820 or 823 format for payment. This usually requires the customer to rewrite some files, Abbott said, but "it's not like having to come up with a whole new receivables system."

Right now, the major cost savings is at the customer end. Estimating that Norwest spent more than $100,000 on the EDI service, including research and development as well as testing and product software development, Abbott said he feels the investment was an absolute necessity.

Piracy

FROM PAGE 1

company. "Who doesn't? It is simply an impossible situation to manage completely."

Companies targeted by SPA have the opportunity to respond within 48 hours and agree to an SPA audit, in which SPA auditors check hard-disk directories against the company's PC software purchase records.

If unauthorized copies are found, the company would then have to destroy them and pay a penalty of the full retail price of each copy to the SPA's copyright defense fund. The company can then repurchase the software licenses for the unauthorized users.

In September of last year, the association set up a toll-free 800 number designed to encourage employees or ex-employees of offending companies to call in and report the unauthorized copying of software. That tactic angered one IS vice-president whose CEO received an audit letter.

"Any disgruntled employee could call the number; suppose he set the trap himself" by copying software, asked the executive, who requested anonymity. "We're in a very competitive industry. There's no way we'll open our doors to anyone."

Stephen C. Rood, a board member of the New York-based Micro Managers Association, said large IS shops will find it difficult to account for every PC software program with original disks or documentation.

"People move around a lot; people lose things," said Rood, who is manager of microcomputer technology at the New York office of Coopers & Lybrand. "If they're talking about a bed-check type of inspection, that leaves a lot of room for false accusations. I think it's a little intrusive and not called for."

Audit bombardment

Since the fourth quarter of 1989, approximately 30 audit letters have been sent, said Mary Jane Saunders, SPA's general counsel. Twelve of the targeted companies have settled, paying an average of between $20,000 and $50,000 to the fund. Ten cases are pending, and another eight are in some stage of notification.

"We are giving companies a quiet, dignified way out of what could be a very embarrassing lawsuit," Saunders said. "I could make a lot of lawyers across the country very rich litigating these cases."

If the company ignores the audit letter, the SPA will bring a lawsuit against the company, she said. Prior to beginning the audit program, SPA sued 33 companies over two years.

Some firms already have strict rules and enforcement policies against unauthorized copying. "We wouldn't want our customers to clone our aircraft engines and not pay us, so we feel it's not right to copy software," said Ron Goldfarb, manager of new office systems technology at United Technologies Corp.'s Pratt & Whitney unit in East Hartford, Conn. "I applaud the [SPA] move."

Goldfarb said he personally snipped unauthorized floppy disk copies in half with scissors; if he found repeat offenders, he did the same to their neckties. "The annual memo doesn't quite do it, but tie-snipping definitely had an impact," he said.

For SPA, the pace of audit letters is likely to pick up. "We are getting 20 calls a day on the 800 number," Saunders said. At that rate, the association could send out well over 100 letters this year.

Dealing for high-end PC service

BY RICHARD PASTORE
CW STAFF

Beneath the splashy debuts of high-end, server-style personal computers such as Compaq Computer Corp.'s Systempro, users and observers are caught by an undercurrent of doubt that the dealer channel can effectively sell and support these systems.

"I'm leery about the capabilities of the dealerships to support a very high-end PC," said Stephen Rood, manager of microtechnology at Coopers & Lybrand in New York. "Even before I bought a Systempro from a dealer, I'd have to find out how many they've sold and whether they have a dedicated staff to support them."

James Grinham, MIS manager at Tremco, Inc. in Cleveland, says his local Entre Computer Centers, Inc. store could probably provide adequate support for a Systempro-type box. "But I wouldn't go so far as to say every Entre could," he qualified.

Such customer qualms are justified, analysts said. "We're talking about network installation, complex network operating systems and fault tolerance, which adds up to a great deal of complexity," said Frank Mischnoff, an analyst at Meta Group, Inc. in Westport, Conn. "Dealers are mostly incapable of providing comprehensive support in these areas."

While most users have relied on in-house expertise for support, circumstances are changing. The technical knowledge that user organizations have is not keeping up with the technology, Mischnoff said. Consequently, more users are turning to dealers for help with increasingly complex systems and applications.

Indeed, at Connecting Point of America, Inc. dealerships, customer requests for support services have grown by 30% to 40% in the last year, said Mark Bennett, director of sales and marketing.

But some users are finding dealers to be of little help in service matters. "I feel that dealers like Nynex Business Centers are moving computers like Carnival moves food," said James Lazazzera, systems manager at Carnival Cruise Lines, Inc. in Miami. "A lot of times, they don't really know what the new products are — they just move them in and move them out."

"We've had a real hard time finding a dealer in the Charlotte area that can support our network needs," complained Chris Wiggins, a microcomputer analyst at Piedmont Natural Gas in Charlotte, N.C.

Piedmont relies on Novell, Inc. for support, but it would prefer to work with the local Businessland, Inc. outlet.

Users' concerns are not falling on deaf ears. "Businessland is spending a lot of time training its technician on networks," Wiggins acknowledged. "But it remains to be seen whether they will ever catch up to the level we need."

Computerland Corp. is also trying to hone its technical edge. "We've got to understand what we're selling; that's what our end users want us to do," said Vic Leventhal, executive vice-president of corporate sales and marketing.

After reading the high-end handwriting on the wall, Computerland is gearing up its training and support efforts to establish itself as a services dealer.

Providing high-level expertise is a difficult proposition for dealers, who increasingly find red ink flowing from squeezed margins. "You have to hire someone who's real good technically, and those people cost a lot of money," Bennett said.

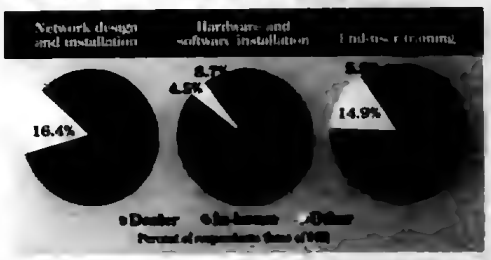
Leventhal said vendors must share the burden of shoring up dealer expertise. "If the reseller is an extension of [the vendor's] sales force, then the vendor had better be willing to help train that group of people."

Toward that end, Compaq recently set up a program that reimburses dealers for expenses they incur in pursuit of high-level technical training. Other vendors such as Apple Computer, Inc. have similar programs.

However, Computerland's Leventhal said, the vendors "still have a long way to go." And in the meantime, it will be the dealers who catch the flak from the frustrated users, he added.

Can dealers deliver?

Dealers, eager to ease their reliance on hardware profit margins, hope to increase their relatively minor share of corporate support



Source: The Ledgeway Group, Inc. CW Chart: John York

1-2-3/M

FROM PAGE 1

However, according to King, Sears, Roebuck & Co. is a different story. Sears is using 1-2-3/M to control, develop and distribute a corporatewide financial budgeting system. King claimed that using 1-2-3/M can cut development time on a financial model down to three or four days vs. the five to six weeks it usually takes. Sears could not be reached for comment.

Tomorrow's briefing, confirmed by two Lotus sources and several analysts, is rooted in Lotus' April 27, 1987 unveiling of its multiplatform strategy. Lotus outlined plans at that time for a version of 1-2-3 running on IBM 370 hosts under VM and MVS.

Slated for delivery in early 1988, 1-2-3/M was to be jointly marketed but solely distributed by IBM.

Based on 1-2-3 Release 3.0, 1-2-3/M will reportedly offer "nearly identical" PC-based 1-2-3 features, including the menu structure. The program uses the host to speed calculations and consolidate data from desktop-based spreadsheets into a master file.

Last week, financial analysts said Lotus had told them 1-2-3/M pricing would be between $30,000 and $50,000. Lotus has said publicly that 1-2-3/M will ship in the first half of 1990. A version of 1-2-3 for Digital Equipment Corp.'s VAX/VMS is expected to follow.

"The fact is, 1-2-3 is being used as the front end for a lot of corporate data," said Barbara Isgur, an analyst at Needham & Co. "Lotus has said 30% of all corporate data is stored in 1-2-3 readable form."

The movement toward a client/server architecture is expected to boost interest in 1-2-3/M. As mainframes take on the role of large file servers, "you'll probably see a 1-2-3/M spreadsheet sharing data with assorted versions of Lotus over a wide-area network," Dataquest, Inc. analyst Marshall Moseley said.

A Lotus source added that the company is hoping 1-2-3/M will spur sales of 3.0, as users of Release 2.0 and 2.2 get acclimated to 3.0 on the mainframe.

Beyond the strategic implications, some analysts questioned the need for a mainframe-based spreadsheet. The idea goes against the current trend toward downsizing applications, according to an industry analyst who follows Lotus.

The analyst questioned whether users could not save money by using a networked version of 1-2-3 based on a heavy-duty PC-based server such as Compaq Computer Corp.'s Systempro.

"A Compaq Systempro server would make sense if you have a big LAN," Murphy said. "But if you have a whole bunch of databases scattered around the country that are not [networked] together in some grandiose scheme, then 1-2-3/M could make sense."

Financial systems reported to be computer security risks

BY MITCH BETTS
CW STAFF

WASHINGTON, D.C. — The nation's stock exchanges and electronic funds transfer networks are vulnerable to computer espionage and viruses, according to a congressional investigation announced last week.

The U.S. General Accounting Office (GAO) said that although no security breaches have been reported so far, tighter computer security is needed in financial markets, and oversight of critical banking networks should be strengthened.

For example, at the time of the GAO audits last year, two vital data centers used by stock exchanges did not test new software to ensure that it was virus-free, nor did they employ auditors to ensure that internal security controls were enforced. The data centers are run by Securities Industry Automation Corp. and the National Association of Securities Dealers.

The GAO said that the data centers are already well protected from external hacker or virus attacks but need stronger protection from virus attacks by insiders. Although stock exchange officials agreed to correct the security flaws cited by the GAO, they argued that the risk of insider crime was low because of already rigorous internal controls.

However, at a congressional hearing on the matter last week, federal officials testified that most of the GAO's security recommendations have been implemented since the audits were completed in October 1989. A GAO official praised the Securities and Exchange Commission and stock exchanges for acting quickly on the audit results.

The hearing was held by the House Subcommittee on Telecommunications and Finance and chaired by Rep. Edward J. Markey (D-Mass.). Markey and several subcommittee members have sponsored a bill (H.R. 3524) designed to outlaw computer viruses unleashed on interstate networks.

The GAO also found security weaknesses at several major networks, including the Fedwire network run by the Federal Reserve System.

Wayne D. Angell, a member of the Federal Reserve Board of Governors, testified that corrective action has been taken on nearly all of the 17 security weaknesses the GAO identified at Fedwire.

Fedwire transfers about $253 trillion per year among the Federal Reserve Banks, depository institutions and government agencies.

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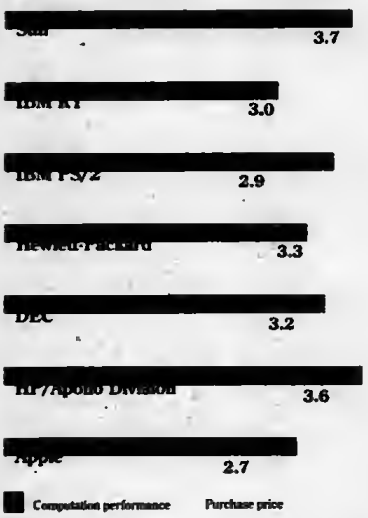
TRENDS

Rating of product satisfaction
1-very unsatisfied, 5-very satisfied
(Respondent base of 647)

Sun Microsystems' pricing strategy, the steam behind its increasing sales, took high honors in the satisfaction rating. However, changes may be on the horizon because Sun's net income continues to slip, even though sales are up. Sun's performance came in second only to Apollo.

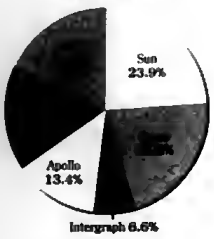


Performance aspects such as increased power, networking capabilities and the caliber of the graphics may be enough reason to change vendors, but it is the price tag that wins most users over.

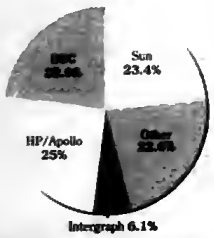
Source: Strategic Focus, Milpitas, Calif.
CW Chart: Tom Monahan

Worldwide market share by revenue

1988
Total $4.15 B

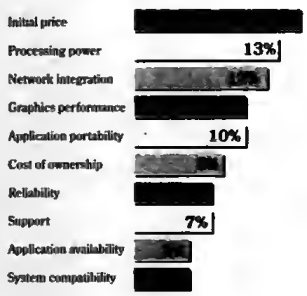


1989
Total $6.55 B



Although Sun remained king of the hill in the workstation market, the true victor in 1989 was DEC, whose worldwide workstation revenue doubled from $750 million in 1988 to $1.5 billion in 1989.

Top 10 reasons for switching vendors
Percent of respondents
(Base of 647)



INSIDE LINES

Next on the agenda

What's next for Next? Several models, according to sources, including an inexpensive entry-level machine that may either compete with Apple's Macintosh or come in as a network version of the firm's existing computer. A speedier, high-end version of the current model is also in the works. Next engineers are also reportedly working on a color version of the system and have gone so far as to show off a color monitor to some customers.

Toy teams' trial troubles teacher

Rumor has it that a group of IBM's information systems executives gathered recently for a management training class, which was possibly held in Canada. The instructor divided the room into groups of five or six people, emptied a huge bag of Legos building blocks, divided them evenly among the IBMers and told them to come back in an hour with a new data center built from the blocks. Each block represented $1 million in building costs, the instructor warned. When he came back an hour later, there were plans that ranged from the most frugal to the very elaborate. "What company do you all work for," the instructor asked. "IBM," they replied. "Then why didn't you work together to build a cost-effective data center?!"

Earliest Paris spring fashions

DEC's never-fail computer — the fault-tolerant VAX ft 3000 — makes its debut tomorrow in Paris wearing two *chapeaux*. One hat makes the new machine look like a front-end processor for the VAX 9000 mainframe, while the second hat shows it off as an add-on machine that will boost the reliability of clustered VAXs.

Feds got the goods on wrong goods?

A disgruntled employee in Georgia stole computer source code from his now-former boss and sold it to a competitor in New Mexico. Now he is being charged under federal statutes that prohibit carrying stolen "goods" across state lines, according to an indictment issued by federal law enforcers in New Mexico. The ex-employee's attorney, however, has filed a motion to dismiss the case on the basis that the source code is copyrightable "intellectual property" and is, in fact, not really goods at all.

Thunder quieted in Texas

More than a year ago, Tandy announced that it would have a compact disc recorder as well as erasable CDs on the market for computer users and music listeners. The machine would cost $500 and be on the market within two years, company officials said at the time. Now, a company insider said the project is way off track because there have been numerous problems ironing out the company's Thor technology. Now, it will be at least two more years before the machine debuts — and at a price that has yet to be determined, according to the the source.

Prime cuts clean cubicles

Those folks seen checking out of Prime Computer with the contents of their desks in paper bags do not add up to a new round of layoffs at the Natick, Mass.-based minicomputer company. According to Prime spokesman Joe Gavaghan, recent and imminent surges of outgoing employees are the visible signs of last fall's announced 2,500-job cutback working its way through the corporate system. As of last week, Gavaghan said, approximately 80% of the affected employees had been notified.

Motorola's invitation to next month's unveiling of new computer products — reported to be powerful 88000-based servers — may be sending the wrong message, accompanied as it was by a supposedly state-of-the-art ballpoint pen that looks like Buck Rogers' spaceship and weighs enough to rip a hole in any shirt pocket. They're into mixed messages; we're into mixed metaphors . . . you can let us know what you're into by sending us a fax (508-875-8931), MCI Mail (address: COMPUTERWORLD), or simply phoning News Editor Pete Bartolik at 800-343-6474.

NEXT WEEK

When help is more than just a phone call away, you need to plan ahead. That is why computerized inventory management is so crucial for **Harold Muller**, vice-president of information systems at Pier 1 Imports, whose buyers can spend months arranging shipments of merchandise from exotic ports to suburban malls.

Database management systems — how far they've come and where they're going — is the focus of Product Spotlight. Of special interest to potential purchasers of relational DBMS products will be a Buyers' Scorecard in which purchasers of eight major relational DBMS products rate their features and their performance on the job.

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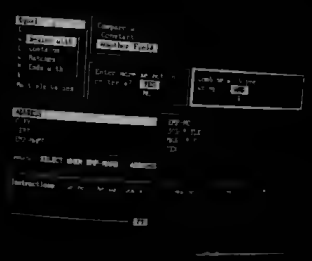

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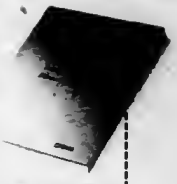

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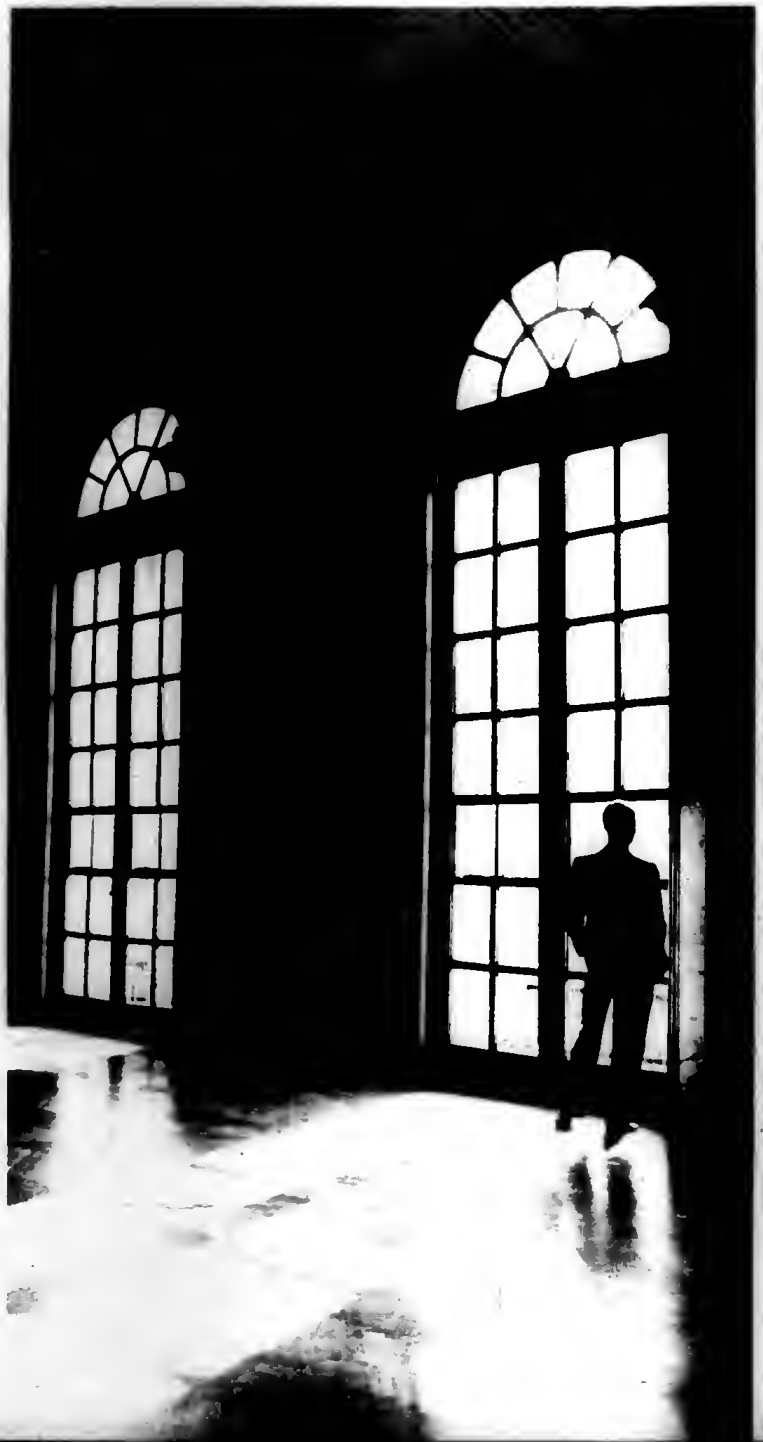

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